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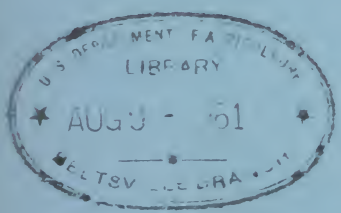
Transportation of Agricultural Commodities in the United States

A Bibliography of Selected References 1949-1959



Miscellaneous Publication No. 863

Economic Research Service
UNITED STATES DEPARTMENT OF AGRICULTURE

TRANSPORTATION OF AGRICULTURAL COMMODITIES
In The United States

A Bibliography of Selected References

1949-1959

Compiled by

Nellie G. Larson, Library

and

C. P. Schumaier, Economic Research Service

Issued June 1961 Miscellaneous Publication No. 863

UNITED STATES DEPARTMENT OF AGRICULTURE

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SOURCES CONSULTED

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Bibliography of Agriculture, 1949-1959

Bureau of Railway Economics Library card catalog

Industrial Arts Index, 1949-1957

Monthly Catalog of U. S. Government Publications, 1949-1959

Public Affairs Information Service Bulletin, 1949-1959

U. S. Dept. of Agriculture Library card catalog

PREFACE

All references except those marked with an asterisk have been examined by one of the compilers.

Abbreviations for the titles of publications cited are explained on pp. 583-614 of U. S. Department of Agriculture Miscellaneous Publication 765, List of Serials Currently Received in the Library of the United States Department of Agriculture as of July 1, 1957. The abbreviation "Ref.", in an entry indicates that the item contains references to literature.

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CONTENTS

	Page
INTRODUCTION	1
BIBLIOGRAPHIES ON RELATED SUBJECTS	3
GENERAL TRANSPORTATION	5
AIR AND WATER TRANSPORTATION	12
REGULATION AND LEGISLATION	14
STATISTICS	20
FREIGHT RATES	24
SHIPPING CONTAINERS	29
REFRIGERATION AND TEMPERATURE CONTROL	32
UTILIZATION OF EQUIPMENT	37
AGRICULTURAL COMMODITIES	40
Dairy Products	40
Fruit	50
General	50
Apples	57
Citrus	59
Melons	66
Peaches	68
Pears	70
Grain and Grain Products	72
Livestock and Livestock Products	82
Poultry and Poultry Products	87
Vegetables	93
General	93
Potatoes	98
Tomatoes	106
Other Commodities	109
INDEX	114

TRANSPORTATION OF AGRICULTURAL COMMODITIES
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A Bibliography of Selected References, 1949-1959

Compiled by

Nellie G. Larson
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Economic Research Service

INTRODUCTION

Agricultural products are particularly sensitive to transportation costs because of their bulk and perishability in relation to value. Research aimed at reducing costs or improving service is used by shippers, carriers, and receivers. Research in the data-gathering field serves as a foundation or background for the determination of State and National transportation policies. It is also widely employed by litigants before the transport-regulatory bodies, and by those bodies in arriving at their decisions.

Since many firms and many regulatory agencies are involved in transportation, research publications and sources of data and other information are scattered. Technology in transportation is advancing at a rapid rate and it is often difficult to locate up-to-date information on the application of new methods and equipment to present transportation problems.

This annotated bibliography was compiled to provide a quick guide to recent publications on agricultural transportation and to factors directly related to transportation such as temperature control, loading and unloading, and container usage. It also provides selected general references and statistical sources on the total transportation system. Although the period covered is 1949-1959, a few 1960 publications have been included.

Publications are classified by commodity when the material pertains to only one commodity. Those not limited to a single commodity are classified by area of interest or mode of transportation. There is a combined author and subject index.

The large number of publications listed gives evidence of the increasing dependence upon research as a means of improving the efficiency and usefulness of our transportation system.

The assistance of Dr. James R. Snitzler in determining the general plan, scope, and coverage of the bibliography is gratefully acknowledged.

BIBLIOGRAPHIES ON RELATED SUBJECTS

1. AGNEW, D. B. Selected references on bulk milk handling (farm to plant). Preliminary. U. S. Agr. Mktg. Serv. AMS-22, 24 p. Mar. 1955. A280.39 M34Am

2. BULL, R. L., and GLADING, G. R. Directory of research reports relating to produce packaging. U. S. Fed. Ext. Serv. Ext. Mimeo. C. 114, 80 p. Rev. Jan. 1960. 275.29 D37M

3. CULLEN, E. O. Trailers-on-flat-cars "Piggybacks": Memorandum listing material on history of service 1926-1953. Washington, Association of American Railroads, 1954. 79 p. Bur. Railway Econ. Libr.
Supplements to this memorandum were issued in 1954 and 1958.

4. FABER, F. L. Bibliography on poultry and egg marketing (preliminary); a selected list of references on the economic aspects of poultry and egg marketing in the United States and Canada. Boston, New England Research Council on Marketing and Food Supply, 1953. 162 p. 241 F112
Transportation, p. 53-56.

5. HALLER, M. H. Handling, transportation, storage, and marketing of peaches; a digest of recent contributions to the knowledge of physical and biological phases of the subject. U. S. D. A. Bibliog. B. 21, 105 p. Dec. 1952. 1 Ag84Bi
References, p. 92-105.
Transportation, p. 57-60.
Packaging, p. 28-35.

6. HARPER, W. R. Bibliography on unit loading principle as applied to transportation. Pts. 1-3. Traffic World 105(13):147-177, Mar. 26, 1960; 105(14):64-81, Apr. 2, 1960; 105(15):80-94, Apr. 9, 1960. 288.8 T672
The bibliography is divided into three broad classifications: Containers; Pallets and skids; and Other unit loads. The section on Containers includes references on piggyback, container on flatcar, fishyback, birdyback, railway car on trailer, and convertible road-rail cargo vehicles.
A supplement by S. Goldenberg appeared in Traffic World 106(24): 85-117. Dec. 10, 1960. 288.8 J672

7. LUTZ, J. M., and WILCOX, M. Partial list of publications on Transportation of the Quality Maintenance and Improvement Section, Biological Sciences Branch, Marketing Research Division, Agricultural Marketing Serv, U. S. Dept. of Agriculture. Washington, Mar. 1959. 52 p. A280.3 M343P
Covers the period 1930-1957.

8. MACOMBER, A. Z., and MOORE, E. J. Bibliography of marketing and other economic information for floriculture and ornamental horticulture. U. S. Agr. Mktg. Serv. AMS-136, rev., 11 p. June 1959. A280.39 M34Am

9. ROSE, D. H., and COOK, H. T. Handling, storage, transportation and utilization of potatoes. U. S. D. A. Bibliog. B. 11, 163 p. Ref. 1949. 1 Ag84Bi
A digest of information published mostly from 1938 to 1948.
Precooling and transportation, p. 35-39.

10. ROSE, D. H., COOK, H. T., and REDIT, W. H. Harvesting, handling, and transportation of citrus fruits; a digest of information on the subject published mostly from 1938 to 1948. U. S. D. A. Bibliog. B. 13, 178 p. Ref. Jan. 1951. 1 Ag84Bi
Transportation, p. 107-125, deals with railroad facilities and shipments, refrigeration services for different seasons, methods of loading in the cars, and containers used. Several shipping and transportation tests are cited.

11. TAFF, C. A. Motor freight transportation bibliography. Prepared for the ATA National Committee on Education. Washington, American Trucking Associations, 1958. 57 p. 241.4 T12
Lists publications issued since 1940.

12. UNITED FRESH FRUIT AND VEGETABLE ASSOCIATION. Where to find the answers to questions about fresh fruit and vegetable marketing. Ed. 4, rev. and expanded. Washington, 1958. 11 p. (Fruit and Vegetable Facts and Pointers). 241.3 Un399

13. U. S. AGRICULTURAL MARKETING SERV. Checklist of reports issued by the Agricultural Marketing Service. Washington, 1960. 23 p. 1.941 E3C41
Supplements are issued monthly.

14. U. S. AGRICULTURAL MARKETING SERV. Periodic reports of the Agricultural Marketing Service. U. S. Agr. Mktg. Serv. AMS-48, rev. 40 p., map. Jan. 1961. A280.39 M34Am

15. U. S. AGRICULTURAL MARKETING SERV. MARKETING RESEARCH DIV. Dairy marketing research reports, a selected list, prepared by the Dairy Section. Washington, 1954. 10 p. A241.3 M343
Supplements to this list have been issued at irregular intervals.

16. U. S. AGRICULTURAL MARKETING SERV. MARKETING RESEARCH DIV. Farm-retail spreads for food products; costs, prices. U. S. D. A. Misc. P. 741, 165 p., tables, charts. Nov. 1957. 1 Ag84M
Pt. 4, Bibliography, contains a list of 374 references, arranged by name of commodity, and includes references to transportation studies.

17. U. S. AGRICULTURAL MARKETING SERV. MARKETING RESEARCH DIV. Publications of the Horticultural Crops Branch. Washington, 1960. 19 p. 1.941 E3C41
Supersedes Publications of the Quality Maintenance and Improvement Section, April 1959.

18. U. S. AGRICULTURAL MARKETING SERV. TRANSPORTATION AND FACILITIES RESEARCH DIV. Publications of the Transportation and Facilities Research Div. (A Reference List). Washington, 1961. 10 p. 1.941 E3C41

19. U. S. AGRICULTURAL RESEARCH SERV. Research on packaging and containers in the U. S. Department of Agriculture. Washington, 1958. 31 p. Ref. A280.3 R313R
Contains a list of selected publications on packaging and containers, p. 28-31, in addition to the research summaries under names of fruits, vegetables, and other agricultural commodities.

20. U. S. BUSINESS AND DEFENSE SERVICES ADMIN. Containers and packaging; basic information sources. Rev. ed. Washington, U. S. Dept. of Commerce, 1955. 20 p. 157.32 C76

A list of sources arranged in seven sections: I, Government publications; II, Nongovernment publications; III, Sources of technical information; IV, Directories; V, Periodicals; VI, Trade associations and groups; VII, Motion picture films.

Nongovernment publications, p. 8-16, is subdivided by topics such as "Carloading and Bracing."

21. U. S. FOREST SERV. FOREST PRODUCTS LABORATORY. List of publications on box and crate construction and packaging data. U. S. Forest Serv. Forest Prod. Lab. Rpt. 791,26 p. Apr.1959. 1.9 F761R

GENERAL TRANSPORTATION

22. AMERICAN INSTITUTE OF COOPERATION. American cooperation. Washington, D. C., 1955-1959. 5 v. 280.29 Am3A

Issued annually. Since 1955, each yearbook has included a section on transportation. It contains papers on the needs, achievements, and developments in rail, motortruck, waterway, and air transportation. Various speakers deal with grain transport, plant location, small lot shipments, new railway equipment and facilities, freight rates, livestock trailers, exempt commodities, trip leasing, barge transport, St. Lawrence Seaway, legislation and regulation, private transportation, and research in transport of agricultural commodities.

23. AMERICAN MANAGEMENT ASSOCIATION. MANUFACTURING DIV. Management of the physical-distribution function; guides for reducing industry's third-largest cost. Amer. Mangt. Assoc. AMA Mangt. Rpt. 49,200 p. 1960. 249.09 AM3Am

Pt. 2, The Transportation Element.

Contents: The common carriers' part in product distribution: a symposium, p. 51-77. I, The rail carriers, by O. Clarke; II, The air carriers, by S. C. Dunlap; III, The barge carriers, by A. C. Ingersoll; IV, The motor carriers, by P. F. Yount; Discussion.

Containerization: a symposium, p. 78-125, I, Progress and problems in implementing the containerization concept, by M. Forgash; II, Containerization and coordinated transportation, by J. L. Weller; III, Containerization in the airlines industry, by F. J. Stevens; IV, A transportation analyst looks at the containerization revival, by F. Muller; V, Containerization from the traffic manager's viewpoint, by L. E. Galaspie; VI, One shipper's containerization problems, solutions, and needs, by R. W. Puder.

Toward a sound framework for national transportation policy, by B. D. Nash.

24. BAUMAN, J. N. Bring hidden delivery costs out into the open. Quick Frozen Foods 15(4):64-66. Nov.1952. 389.8 Q4

Recommends that all processing plants should analyze and evaluate their present fleet of trucks to see that trucks are specially fitted for services to which they are put, and that their operating and maintenance costs are not out of line.

25. BLACK, G. Long-haul truck transportation of California fresh fruits and vegetables. Giannini Found. Agr. Econ. Mimeo. Rpt. 174,78 p. Feb.1955. 281.9 G34M

California Agricultural Experiment Station, cooperating.
Contains a detailed study of trucking methods, costs, requirements, equipment used, public regulation of motor carriers, exempt commodities, trip-lease controversy, why trucks are used instead of rails, and better ways of assembling loads.

26. BREDO, W., SHREVE, R. O., and HAMMAN, C. L. Transportation problems of expanding western agriculture. Washington, U. S. Agr. Mktg. Serv., 1954. 217 p. Ref. A280.3 M34T
Prepared by the Stanford Research Institute under a research contract with the U. S. Department of Agriculture.
Transportation factors affecting major Columbia basin commodities, p. 89-153, considers dairy products, livestock and meats, potatoes, wheat and wheat flour, and frozen fruits and vegetables.
Transportation problems of general interest to western agriculture, p. 154-179 contains discussion of transportation costs, exemption of agricultural commodities from rate regulation, uniform class rates, trade barriers, diversion from rail to motor carriers, and the impact of improved inland waterways on the Columbia and Snake Rivers.

27. BYRNE, R. J. Coordinating transportation improves marketing and purchasing for Minnesota cooperatives. U. S. Farm Credit Admin. B. 57, 64 p. May 1950. 166.2 B87
The operation of trucks on a cooperative basis by the Northern Cooperatives, Inc. of Wadena, Minn. (a federation of local associations) has resulted in both economy and service to the member cooperatives and in turn to their farmer patrons. Discusses adequate loading and unloading facilities at the terminal, equitable distribution of equipment, satisfactory rates, and keeping the inbound and outbound hauling in balance.

28. CHURCH, D. E. Current transportation situation. U. S. Bur. Agr. Econ. Mktg. & Transportation Situation MTS-97: 8-14. June 1951. 1.941 M8M34
Discusses the demand and shortages of boxcars, request for increased freight rates, and decisions affecting trucking of agricultural products.

29. CHURCH, D. E. Transportation of fresh fruits and vegetables by agricultural assemblers: 12 months ended June 30, 1957. Washington, U. S. Bur. Census, Transportation Div., 1958. 20 p., tables. 157.41 T682T
About 63 percent of the rail tonnage as compared with 28 percent of the motor carrier tonnage moved between points that were more than 1,000 miles apart on a straight-line basis. Motor carriers handled a larger share of the tonnage than rails except for distances of 1,000 miles or more.

30. CONFERENCE ON TRANSPORTATION OF PERISHABLES. Proceedings; 1953, 1954, 1956, 1958. San Francisco, California Terminal Railroads, 1953-58. 4 v. 280.39 C765
Presented by the University of California in cooperation with the Fruit and Vegetable Industries, and California Terminal Railroads.
Contain the texts of papers by many speakers on such subjects as refrigeration, temperatures in transit, and transportation of different fruits and vegetables. Several of these are listed separately under the appropriate subject in this bibliography.

31. CORBETT, J. W., and others. Modern railroad operations. Conf. Transportation Perishables. Proc. 1954:108-121. 280.39 C765
H. C. Munson, A. D. Hanson, and C. R. Tucker, joint authors.
Describes handling of fruit and vegetables, scheduling, switching, connections, eliminating delays, servicing en route, and loss and damage.

32. FAGG, C. J., and WELLER, W. W., comp. Freight traffic redbook; a practical reference book for those actively engaged in traffic work; an everyday guide for the shipper; a condensed but comprehensive textbook for the student of freight transportation. New York, Traffic Publishing Co., 1955. 1372 p., map. 289.2 T67 28th Supplement No. 1, issued March 10, 1957. 36 p.
Compendium of information on laws, rules, regulations, rates, taxes, decisions, claims, freight rates, and loading.

33. FAIR, M. L., and WILLIAMS, E. W. Economics of transportation. Rev. ed. New York, Harper, 1959. 684 p. Libr. Cong.
Complete treatment of the economics of the American transportation system including a discussion of the demand for transportation by the agriculture industry and the historical determinates of rates for grain, sugar, and livestock.

34. FINNER, W. F. Interstate and interregional trade flows for agricultural products. J. Farm Econ. 14(5):1050-1060. Dec.1959. 280.8 J822
Discussion by A. R. Koch, and V. I. West, p. 1060-1064.
Indicates the uses in economic analysis of data showing commodity movements among geographic regions and shows the sources of such data and methods of data improvement.

35. FRASER, D. V. What price transportation. Sowest. Shippers Adv. Bd. Proc. 84:17-20. 1950. 289.29 So83
Discusses the reasons for low railroad earnings, including unfair truck competition by using public highways without adequate compensation for that use.
Efforts are being made by the railroads to improve plants and operating efficiency.

36. HENDERSON, J. M., and LINNENBERG, C. C. Shifts in rail and truck transportation of fresh fruits and vegetables. U. S. D. A. Mktg. Res. Rpt. 237, 52 p. Ref. June 1958. 1 Ag84Mr
Rail shipments decreased while truck shipments increased about four percent of the 1954 unloads of selected commodities at 13 major markets. Individual movements most heavily affected were potatoes, citrus, and tomatoes.

37. HERDMAN, W. A. Truck transportation of perishables; the problems of shippers. Conf. Transportation Perishables. Proc. 1956: 95-100. 280.39 C765
Gives specific illustrations of the difficulties with schedules of trucks, drivers, trucks without insulation, overloading, pickups of mixed loads, dispatching, refrigeration, loading wet and dry produce, and neglect of cooling en route.

38. KING, R. A., and HENRY, W. R. Studies of interregional competition; transportation models in studies of interregional competition. J. Farm Econ. 41(5):997-1011. Dec.1959. 280.8 J822
Discussion by R. Sargent and R. J. Foote, p. 1035-1039.

Describes the general problem and appraises one model, that appears to have great potential usefulness, with rather complicated mathematical procedures.

39. LINNENBERG, C. C. Proposals for basic change in transport policy. U. S. Agr. Mktg. Serv. Mktg. & Transportation Situation MTS-118:17-29. July 1955. 1.941 M8M34
Analysis of a report, by a Presidential Advisory Committee, released on April 18, 1955, entitled Revision of federal transportation policy.
Also issued as a separate reprint with call number A289 M342

40. LITTLE, J. E., CUNNINGHAM, H. M., and STILES, C. E. Historical development of transport coordination and integration in the United States. Washington, U. S. Interstate Com. Comn., Bur. Transport Econ. & Statis., 1950. 217 p. (Its Statement 5015). Libr. Cong.
Among companies of the same type and among the different types of transportation.

41. LOCKLIN, D. P. Economics of transportation. Ed. 4. Homewood, Ill., Irwin, 1954. 916 p. Libr. Cong.
A thorough analysis of the economics of transportation is provided, including internal economic problems as well as the relationship between the transportation industry and the economy as a whole together with a discussion of Agricultural Exemptions.

42. MARCOUX, W. T., SPERLING, C., and HALDEMAN, R. C. Recent developments in transportation. U. S. Agr. Mktg. Serv. Mktg. & Transportation Situation MTS-135:40-46. Oct. 1959. 1.941 M8M34
Reviews piggyback operations, the Federal highway program, and traffic developments on the St. Lawrence Seaway.

43. MEYER, J. R., and others. The economics of competition in the transportation industries. Cambridge, Harvard U. Press, 1959. 359 p. Libr. Cong.
M. J. Peck, J. Stenason, and C. Zwick, joint authors.
Examines the cost structure of different modes of transport and comments on the rational allocation of transport resources. The user charges on airlines, trucks, and barges are discussed and their effect estimated. The authors argue for less regulation.

44. NATIONAL CONFERENCE ON HANDLING PERISHABLE AGRICULTURAL COMMODITIES, 9th-14th. Papers. Lafayette, Ind., Purdue U. Col. Agr., 1955-1960. 5 v. 280.39 N2123
Sponsored by College of Agriculture and Agricultural Extension Service, Purdue University, Association of American Railroads, American Railway Development Association in cooperation with Western Weighing and Inspection Bureau, Transcontinental Freight Bureau, U. S. Department of Agriculture, and Railway Express Agency. Held in March, annually.
The speakers dealt with such subjects as load size, containers, commodity temperatures in refrigerator cars, bin or pallet boxes, protective services, piggyback operations, temperature controls, loss and damage during transit, loading methods, exempt commodities, precooling, and research activities. They discussed transportation of apples, citrus fruits, grapes, peaches, pears, frozen fruits and vegetables, strawberries, watermelons, asparagus, carrots, celery, lettuce, onions, potatoes, sweet corn, tomatoes, and vegetables.

45. NEAL, J. D. Some current problems in the transportation of perishables. Sowest. Shippers Adv. Bd. Proc. Mar.30,1949:14-15. 289.29 So83
Fruit and vegetable transportation is considered in relation to such factors as distance to market, rates, speed, and difficulties with reconsignments.

46. NELSON, J. C. Patterns of competition and monopoly in present-day transport and implications for public policy. Land Econ. 26(3):232-248. Aug.1950. 282.8 J82
In rail and motor transport.

47. NELSON, J. C. Railroad transportation and public policy Washington, Brookings Inst., 1959. 512 p. U. S. Dept. Com. Libr.
Appendix contains 55 tables.
The author discusses the problems of the railroads against the background of growing competition. He suggests methods for preserving the rail transportation structure and at the same time evolving a least cost transportation system for the nation.

48. PENROSE, G. L., FULLER, L. T., and SHARKEY, J. B. Transportation spells markets. Oreg. Dept. Agr. Agr. B. 167:16-19. Sept.1950. 2 Or3
On the importance of trucks in the development of all branches of industry in Oregon, and the efficient service offered the Snake River Valley by the Union Pacific Railroad.

49. PLOWMAN, E. G. A shipper looks at national transportation policy. Harvard Business Rev. 34(2):128-136. Mar.-Apr.1956. 280.8 H262
Suggests the best way to avoid the chaos of freight rate wars, at one extreme, or the nationalization of railroads at the other extreme, is to modify the Interstate Commerce Commission Act, but keep rate regulation in the public interest.

50. PURCELL, M. R. The transportation situation. U. S. Bur. Agr. Econ. Mktg. & Transportation Situation MTS-109:12-16. Apr. 1953. 1.941 M8M34
Comments on 1953 conditions relating to boxcars, refrigerator cars, truck leasing rules decision, and legislation introduced in Congress.

51. QFF'S annual transportation review. Quick Frozen Foods 21(4):79-88. Nov.1958. 389.8 Q4
Title was Transportation review in 1950-1952.
A review of trends, methods, and equipment, issued each year in November, except in September 1949, October 1950, October 1951, and December 1957.
Summarizes annual developments on freight rate changes, exempt truckers, motor carrier surveys, court decisions, leasing of trucks, rating methods for truck-trailers, problems of less-than-truckloads, improvements in equipment, frozen foods spoiled in transit, rejected cargoes, and expansion in truck fleets and rail facilities.

52. REFRIGERATED truck lines equipped to handle frozen food shipments; QFF's annual revised listing of refrigerated trucking companies, routes and equipment. Quick Frozen Foods 22(4):105-116. Nov.1959. 389.9 Q4
A directory issued each year in November, except in March 1949, February 1950, October 1951, and December 1957.

Arranged alphabetically by name of company, but some issues are by State or area.

53. ROBERTS, M. J. The motor transportation revolution. Business Hist. Rev. 30(1):57-95. Mar.1956. Libr. Cong.
Historical analysis of the evolution of the motor transportation industry, with emphasis upon the different developmental patterns exhibited by various motor carrier classifications, upon the competitive interaction of rail and motor transport interests, and upon the far-reaching effect of State and Federal regulation.

54. SCHOOLCRAFT, C. D. Motor truck transportation of fruits and vegetables. Amer. Pomol. Soc. Proc. 64/65:140-148. 1950/51. 81 Am33
Summarizes the growth of truck transportation, with comments on market news operations and the reporting of truck movements by State and Federal agencies.

55. SLAVICH, J. Railroad and truck transportation of perishables, the problems of shippers and receivers. Conf. Transportation Perishables. Proc. 1956:23-26. 280.39 C765
A general discussion relating to refrigeration, inspection of quality of fruit, maintaining of regular schedules, tariff rates, and unloading charges.

56. SNITZLER, J. R. The current transportation situation. U. S. Agr. Mktg. Serv. Mktg. & Transportation Situation MST-117:11-16. Apr.1955. 1.941 M8M34
Reviews the 10-year National Highway Program, legislation introduced in Congress, and transportation charges and rate cases.

57. SNOWDEN, O. L., and DONAHOO, A. W. Profitable farm marketing. Englewood Cliffs, N. J., Prentice Hall, 1960. 403 p.,illus. 280.3 Sn6
Transportation is shown as a segment of marketing. The authors present estimates of the costs of transportation for various commodities and discuss necessity for careful shipping techniques. Basically an elementary text.

58. SPERLING, C., LINNENBERG, C. C., and DEWOLFE, M. R. Recent developments in freight rates and transport policy. U. S. Agr. Mktg. Serv. AMS-293,14 p. Jan.1959. A280.39 M34Am
Reprinted from the Marketing and Transportation Situation, April and November 1958. 1.941 M8M34

59. TAFF, C. A. The competition of long-distance motor trucking: farm and industrial products and supplies. Amer. Econ. Rev. 46(2):508-520. May 1956. 280.8 Am32
Reviews recommendations of the Presidential Advisory Committee on Transportation Policy and Organization as well as decisions of the Interstate Commerce Commission, including exempted agricultural commodities.

60. UNITED FRESH FRUIT AND VEGETABLE ASSOCIATION. Yearbook. Washington, 1959. 241 p. 280.3939 Un3
Issued annually. Earlier volumes entitled Annual convention.
Contains text or summaries of papers read at the annual meeting. A selected few of these papers are listed under the appropriate subject in this bibliography.

61. U. S. AGRICULTURAL MARKETING SERV. Recent developments in transportation. U. S. Agr. Mktg. Serv. Mktg. & Transportation Situation MTS-115:41-46. Oct.28,1954. 1.941 M8M34
Considers "Piggy-Back" or trailer-on-flat-car service, "Sea-Land" service, a 50 billion dollar road-building program, and recent legislation.

62. U. S. AGRICULTURAL MARKETING SERV. MARKETING RESEARCH DIV. Food transportation and what it costs us. U.S.D.A. Misc. P. 738,23 p. 1956. 1 Ag84M
Summarizes the role of transportation, the kinds of haulers, services, trends, length of haul, costs and why they have increased, changes in freight rates, and costs of such services as refrigeration and cartage.

63. U. S. DEPT. OF AGRICULTURE. Marketing; the yearbook of agriculture. 1954. Washington, 1954. 506 p. 1 Ag84Y
Partial contents: From farms to the first market, by D. E. Church and M. R. Purcell, p. 87-92; The kinds and uses of carriers, by W. J. Hudson and D. C. Leavens, p. 92-99; A century of progress, by J. C. Winter, p. 99-103; Iceboxes on wheels, by J. A. Mixon, and H. D. Johnson, p. 103-104; Regulations and policies, by R. L. Dewey, p. 104-109; Ways to save time and work, by W. H. Elliott, p. 365-369.

64. WAYNE, D. C. Agricultural transportation. U. S. Agr. Mktg. Serv. AMS-388:35-38. July 1960. A280.39 M34Am
Paper presented at the National Marketing Service Workshop at West Lafayette, Ind., November 17-19, 1959.
On the importance, problems, and trends in agricultural transportation.

65. WESTMEYER, R. E. Economics of transportation. Englewood Cliffs, N. J., Prentice Hall, 1952. 741 p. Libr. Cong.
Covers all modes of transportation and gives concrete facts and modern data on the actual problems which transportation agencies face including a definition and discussion of Exempt Carriers.

66. WILSON, G. L. Elements of transportation economics. New York, Simmons-Boardman, 1950. 178 p. 289 W69E
Describes the interrelation of transportation with other economic activity. Relates availability and costs of agricultural products to agricultural development.

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72. BLOUNT, J. P. Recent advances in air transportation of perishable foods. Food Technol. 4(8):332-334. Aug.1950. 389.8 F7398
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74. CHURCH, D. E. Domestic movement of selected commodities in United States waterborne foreign trade, 1956. Washington, U. S. Bur. Census, 1959. 40 p.,tables. U. S. Bur. Census Libr.
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80. PHILLIPS, S. W. American farmers and the St. Lawrence Seaway. U. S. Agr. Mktg. Serv. Mktg. & Transportation Situation MTS-118:9-16. July 26, 1955. 1.941 M8M34
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85. U. S. ARMY CORPS OF ENGINEERS. Transportation lines on the Mississippi River System and the Gulf Intercoastal Waterway, 1959. Prepared by the Board of Engineers for Rivers and Harbors. Washington, 1959. 377 p. (Transportation Series 4). 152.25 T68
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88. BLACK, G. Agricultural interest in the regulation of truck transportation. J. Farm Econ. 37(3):439-451. Aug.1955. 280.8 J822
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89. CAMPBELL, T. C. Agricultural exemptions from motor carriers regulation. Land Econ. 36(1):14-25. Feb.1960. 282.8 J82
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90. CROW, W. C. Roadblocks in the path of transportation. United Fresh Fruit & Veg. Assoc. Annu. Conv. 45:134-137. 1949. 280.3939 Un3
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91. CURRY, T. C. The Perishable Agricultural Commodities Act; an enlightening review. United Fresh Fruit & Veg. Assoc. Annu. Conv. 45:90-92. 1949. 280.3939 Un3
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92. HILLMAN, J. S., and ROWELL, J. D. Barriers to the interstate movement of agricultural products by motor vehicle in the eleven Western States. Ariz. Agr. Expt. Sta. B. 248,47 p. June 1953. 100 Ar4

The economic significance of interstate barriers affecting trucking in western agriculture are discussed, as are various aspects of laws which restrict interstate movement of agricultural products. These restrictions arise from provisions relating to registration, taxes, weight and dimension, merchant trucker, financial responsibility, nonuniformity, and miscellaneous equipment requirements in trucking.

93. HILLMAN, J. S., and ROWELL, J. D. A summary of administrative rules and regulations relating to the interstate movement of agricultural products in the eleven Western States. Ariz. Agr. Expt. Sta. Rpt. 110,107 p. Feb.1953. 100 Ar4M
Motor vehicles, p. 5-13.

94. HILLMAN, J. S., and ROWELL, J. D. A summary of laws relating to the interstate movement of agricultural products in the eleven Western States. Ariz. Agr. Expt. Sta. Mimeog. Rpt. 109,105 p. May 1952. 100 Ar4M
Motor vehicle laws are summarized by State, p. 5-19, and cover the following aspects: registration fees; registration-nonresident reciprocity; mileage, gross receipts, and other taxes; weight and dimension restrictions; and additional regulations affecting interstate carriers.

95. KESSNER, T. L., AXELROD, A., and MILLER, C. J. Federal and State laws and regulations affecting the movement of wheat from Kansas, Nebraska, South Dakota and North Dakota, and rules of the Kansas City and Minneapolis grain exchanges. Nebr. U. Col. Agr. Dept. Agr. Econ. Rpt. 16,277 p. Feb.1960. 281.9 N27
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96. KUTISH, L. J. Regulations on weight of motortrucks; problems illustrated by Wisconsin's experience in hauling fluid dairy products. U. S. D. A. Mktg. Res. Rpt. 28,49 p. Nov.1952. 1 Ag84Mr
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97. LIMMER, E. The Federal excise tax on the transportation of property with special reference to agriculture. Washington, U. S. Bur. Agr. Econ., 1949. 37 p. 1.941 F5F31
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98. LIMMER, E. Transportation developments. U. S. Agr. Mktg. Serv. Mktg. & Transportation Situation MTS-123:44-45. Oct.1956. 1.941 M8M34
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99. LINNENBERG, C. C. The agricultural exemptions in interstate trucking: mend them or end them? Law & Comtemp. Problems 25(1):139-183. Winter 1960. U. S. D. A. Law Libr.
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related issues, legislative and judicial history, volume, merits and faults of exempt trucking, recent restrictive proposals, the Transportation Act of 1958, and alternatives to exemption.

100. NELSON, R. A. Is our transport regulatory policy based on outdated concepts? Wash. U. Business Rev. 17(7):9-17. Apr.1958. Wash. U. Libr.
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104. PINKNEY, J. F. Exemption of agricultural commodities from motor carrier regulation. Pub. Util. Fortnightly 58(7):498-501. Sept.27,1956. 280.8 P966
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105. POTH, L. A. Transportation rates, products transported and trade barriers important to South Dakota 1949. So. Dak. U. Sch. Business Admin. Business Res. Bur. B. 23,110 p. Mar.1950. 280.9 So88
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106. PRIZER, J. B. Development of the regulation of transportation during the past seventy-five years. Pub. Util. Fortnightly 52(9): 605-635. Ref. Oct.22,1953. 280.8 P966
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107. PURCELL, M. R. Interstate barriers to truck transportation; history and current status of regulations regarding size and weight, taxes and other selected phases that affect trucking. Washington, U. S. Bur. Agr. Econ., 1950. 117 p. Ref. 1.941 M2In8
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111. SEALS, D. Truck leasing and the exempt trucker. United Fresh Fruit & Veg. Assoc. Ybk. 53:197-198. 1957. 280.3939 Un3
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tural exemption upon motor carriers.

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116. SPERLING, C. The agricultural exemption in interstate trucking; a legislative and judicial history. U. S. D. A. Mktg. Res. Rpt. 188,71 p. July 1957. 1 Ag84Mr
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Also reviews decisions of the Interstate Commerce Commission and the courts. The appendix contains an extensive list showing the status of various commodities, as ruled by the Interstate Commerce Commission on March 19, 1958.

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119. STEDMAN, G. C. Shall trip-leasing continue? Or will exempt agricultural haulers be forced to abandon their service to the fresh fruit and vegetable industry? United Fresh Fruit & Veg. Assoc. Annu. Conv. Ybk. 50:167-169. 1954. 280.3939 Un3
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covered are: Carrier's noncompliance with instructions; Demurrage; Diversion; Freight claims; Freight rates and charges; Refrigeration; Ventilation; Transportation service; Sales by carrier; Transit risks. In Vol. II, there is supplementary material on these same topics.

121. U. S. AGRICULTURAL MARKETING SERV. Regulations (other than rules of practice) of the Secretary of Agriculture for the enforcement of the Perishable Agricultural Commodities Act, 1930, as amended. U. S. D. A. Serv. & Regulat. Announc. 121,37 p. Rev. July 1960. 1 M34S

Reprint of Title 7, Ch. I, Pt. 46, of the Code of Federal Regulations. In addition to the regulations which deal mainly with licenses and accounts and records, the text of the Act appears, p. 11-25.

122. U. S. AGRICULTURAL RESEARCH SERV. ANIMAL DISEASE ERADICATION DIV. A guide for the enforcement of regulations governing the interstate movement of livestock and poultry. U. S. Agr. Res. Serv. ARS 91-13,27 p. Aug.1959. A41.9 R315Ar

An outline of uniform procedure to be used in reporting apparent violations of the animal quarantine laws, and of the 28-hour law. Includes the disinfection of railroad cars and trucks, as well as feeding, watering, and resting livestock during transit.

123. U. S. INTERSTATE COMMERCE COMMISSION. Motor transportation of commodities formerly exempt from economic regulation. Washington, 1958. 8 p. (Its Inform. B. 1). Aug. 1958. Interstate Com. Comn. Libr.

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124. U. S. INTERSTATE COMMERCE COMMISSION. No. Mc-C-968. Determination of exempted agricultural commodites. Submitted December 8, 1949. Decided April 13, 1951. U. S. Interstate Com. Comn. Rpt. Motor Carrier Cases 52:511-566. 1951. U. S. D. A. Law Libr.

Discussion and decision on the meaning of "agricultural commodities (not including manufactured products thereof)". Appendix includes lists of commodities held to be within the exemption and commodities held to be manufactured products, and hence not within the exemption.

A part of this decision was reconsidered and amended on June 30, 1953. U. S. Interstate Com. Comn. Rpt. Motor Carrier Cases 62: 87-89. 1953.

125. U. S. LAWS, STATUTES, ETC. Compilation of statutes relating to marketing activities, including research, service, and regulatory work of the Agricultural Marketing Service, United States Dept. of Agriculture, as of June 30, 1957. U. S. D. A. Agr. Handb. 130,210 p. Jan.1958. 1 Ag84Ah

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126. WILLIAMS, E. W. The regulation of rail-motor rate competition. New York, Harper, 1958. 247 p. Ref. Libr. Cong.

A critical examination of what the Interstate Commerce Commission and the carriers have done since passage of the Motor Carrier Act of 1935, with an appraisal of the Commission's performance.

127. AIR TRANSPORT ASSOCIATION OF AMERICA. Air transport facts and figures. Ed. 21. Washington, 1960. 31 p. Private file.
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Shipments of agricultural products in 1949, with statistics by commodity groups. Shows sources and destinations of rail freight imports and exports from the State.

129. ASSOCIATION OF AMERICAN RAILROADS. CAR SERV. DIV. CS-54B. Cars of revenue freight loaded, 1959-1945. Washington, 1960. 10 p. Bur. Railway Econ. Libr.
A 20-year summary based on weekly reports, of freight car loadings of specified commodities, including grain and grain products and livestock.

130. AUTOMOBILE MANUFACTURERS ASSOCIATION. Motor truck facts. Washington, 1959. 48 p. 289.49 Au82
Issued annually.
A compendium of statistical tables showing truck registrations by gross weights and by States, truck fleets of 10 or more vehicles, trucks on farms, farm truck expenditures, excise and use taxes, freight tonnage hauled by motortruck, and volume of fruits, vegetables, poultry and eggs, and livestock hauled by truck.

131. BYRNE, R. J., and CONYERS, L. N. Motortruck inventory of farmer cooperatives March 31, 1951. U. S. Farm Credit Admin. Coop. Res. & Serv. Div. Misc. Rpt. 168,20 p. Dec.1952. 166.3 M68
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132. CHURCH, D. E., and DEWOLF, M. R. Carloads of agricultural and nonagricultural commodities originated by type of car, 1947-50. Washington, U. S. Bur. Agr. Econ., 1951. 16 p.,tables. 1.941 M2C10
Gives statistics from which to measure the demand for each type of railroad car. Includes estimates of the number of carloads by class of commodity, that are moved quarterly in refrigerator, box, and stock cars.

133. CHURCH, D. E. Survey of transportation from farms to initial markets. Agr. Econ. Res. 1(2):48-51. Apr.1949. 1 Ec7Agr
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134. CHURCH, D. E., and SNITZLER, J. R. Trucks haul increased share of fruit and vegetable traffic; selected fresh fruits and vegetables, 1948 and 1951. Washington, U. S. Bur. Agr. Econ., 1953. 24 p. 1.941 M2T762
The diversion of rail traffic to trucks as judged by unloads of eight

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135. DAVIS, L. H. Trends in unloads of vegetables at New York City, 1935 to 1954. Cornell U. Col. Agr. A. E. 1009,25 p. Nov.1955. 281.9 C81
Shows changes in total receipts of certain vegetables in New York City, and receipts from New York State and competing sources of supply. Data for 12 vegetables are shown separately.

136. FARRELL, K. R. Grain marketing statistics for the North Central States, for the North Central Grain Marketing Research Committee. Columbia, Mo. Agr. Expt. Sta., June 1958. 428 p. 280.359 F24
Section 5, Grain shipments, p. 131-188, contains a series of tables indicating the type of carrier, the direction and distance of shipments, of major types of grain from terminal elevator and wholesale grain processing plants.

137. HALDEMAN, R. C., and others. Grain transportation statistics for the North Central Region. U. S. D. A. Statis. B. 268,131 p., charts, tables, maps. Aug.1960. 1 Ag84S
R. M. Bennett, J. R. Corley, R. O. Foster, and J. H. Hunter, joint authors.
Grains covered are corn, soybeans, wheat, oats, barley, and sorghums for grain.
Tables show comparative domestic charges for transporting grain by truck, rail, and barge and many other aspects of the movement of grains for 1956, 1957 and 1958. Includes country and terminal elevator surveys, comments of elevator operators on equipment, rate increases, and reasons for changing mode of transport.

138. LIMMER, E. Transportation of selected agricultural commodities to leading markets by rail and motortruck, 1939-50. Washington, U. S. Bur. Agr. Econ., 1951. 42 p. 1.941 M2T68
Tables show rail and truck receipts of farm products in major markets, by commodity and by years. Findings are summarized and discussed.

139. LINNENBERG, C. C. Rail and truck shares in the hauling of perishables: some recent developments. U. S. Agr. Mktg. Serv. Mktg. & Transportation Situation MTS-130:40-48. July 1958. 1.941 M8M34
Truck unloads of eight important fresh fruits and vegetables at a group of large cities increased relatively to rail unloads, 1951-1957. Records for both shell eggs and frozen eggs show that the railroads share had decreased to almost zero.
Also reprinted as AMS-266, Aug.1958. A280.39 M34Am

140. PURCELL, M. R. Length of haul to leading markets by motortruck, 1941 and 1950; selected fruits and vegetables. Washington, U. S. Bur. Agr. Econ., 1953. 62 p. 1.941 M2L54
Changes in truck unloads and in average length of haul to eight major markets for ten selected fruits and vegetables are shown in many tables and analyzed in the text.

141. PURCELL, M. R. Statistical findings of survey of transportation from farms to initial markets. Washington, U. S. Bur. Agr. Econ., 1949. 29 p. 1.941 H2T68

Based on nationwide interviews on farms in some 800 counties to gain information on farm ownership of motortrucks and trailers, commodities moved from farms in farm-owned, hired, or buyers' equipment, and amount of direct haul of products to market.

142. REEVES, H. T., and SMITH, H. V. Pattern of distribution of fruits and vegetables shipped by railroad, 1939 and 1947, and transportation charges, 1947. Washington, U. S. Bur. Agr. Econ., 1950. 1.941 M2P27

Data are given in 42 tables showing distribution by origin and by destination of commodities.

143. TEXAS CITRUS & VEGETABLE GROWERS & SHIPPERS. 1959 yearbook; 17th annual convention, September 14, 15, 16, Dallas, Texas. Harlingen, Tex., 1959. 188 p. 280.39 T313Y

Contains several tables showing carlot rail shipments from principal shipping points, of Texas fruits and vegetables, by commodity and by years 1954-1958. One table shows piggyback shipments for the major commodities.

144. U. S. AGRICULTURAL MARKETING SERV. Carlot unloads of certain fruits and vegetables in 100 U. S. and 5 Canadian cities, also truck unloads in 39 U. S. cities and 5 Canadian cities, calendar year 1959. U. S. Agr. Mktg. Serv. AMS-25, 150 p., tables. Mar.1960. A280.39 M34Am

Issued annually.

Rail unloads for port cities include boat receipts of imports in carlot equivalents. Covers 21 commodities in 29 tables.

145. U. S. AGRICULTURAL MARKETING SERV. AGRICULTURAL ECONOMICS DIV. Farmers' expenditures for motor vehicles and machinery with related data, 1955. U. S. D. A. Statis. B. 243, 98 p., tables. Mar.1959. 1 AgSt

Tables 31-55 contain information on motortrucks—number owned, costs, types of farms, expenditures for operation and maintenance, and miles driven.

146. U. S. AGRICULTURAL MARKETING SERV. FRUIT AND VEGETABLE DIV. Fresh fruit and vegetable carlot shipments by States, commodities, counties and stations calendar year 1959. U. S. Agr. Mktg. Serv. AMS-41, 62 p., tables. Apr.1960. A280.39 M34Am

Rail and piggyback shipments are shown in carlots and truck and boat shipments are shown in carlot equivalents. The list of commodities contains 45 items of which a few are mixed fruits and vegetables. There are three tables for each State: Table A, Annual shipments by commodities and months; Table B, Annual shipments by commodities, counties, and months; Table C, Annual shipments by counties, stations, and commodities.

147. U. S. AGRICULTURAL MARKETING SERV. FRUIT AND VEGETABLE DIV. Table of carlot conversion factors; fruits and vegetables, effective January 1, 1960. Washington, 1960. 7 p. A289.2 M34

To be used for converting truck and boat shipments and receipts to approximate rail carlot equivalents.

148. U. S. ARMY. CORPS OF ENGINEERS. Waterborne commerce of the United States, calendar year 1958. Parts 1-5 and Supplement. 6 v. Detroit, 1959. 152.25 W29

Issued annually.

Contents: Pt. 1, Waterways and harbors, Atlantic Coast; Pt. 2, Gulf Coast, Mississippi River system and Antilles; Pt. 3, Great Lakes; Pt. 4, Pacific Coast, Alaska, and Pacific Islands; Pt. 5, National summaries; Pt. 5, Supplement, Domestic inland traffic areas of origin and destination of principal commodities.

Presents data on foreign and domestic commerce, on the movements of commodities and vessels at the ports, harbors, waterways, and canals of the United States and its possessions. Commodities are indicated by code number and include the major agricultural products.

149. U. S. BUR. OF PUBLIC ROADS. Highway statistics, 1957. Washington, 1959. 200 p. 177.7 H53

Issued annually.

A compilation of statistics which includes figures on truck and tractor-truck registrations, trailer and semitrailer registrations, rates and revenues, and Federal tax rates on vehicles and motor fuels.

150. U. S. BUR. OF THE CENSUS. Statistical abstract of the United States, 1960. Washington, 1960. 1040 p. 157.9 St2

Issued annually.

Partial contents: Transportation, land and air, p. 565-586. Waterways, water traffic, and shipping, p. 587-602. Figures cover a series of years, through 1959.

151. U. S. BUR. OF THE CENSUS. TRANSPORTATION DIV. Pilot survey; commodity movements by truck; March-May 1953. Washington, 1954. 67 p. Libr. Cong.

Tables show: A, Tons carried, ton-miles, and average length of haul; B, Number of owners of private and exempt vehicles used for hauls of 25 miles or more; C, Tons carried by commodity and size of vehicle; D, Ton-miles; E, Number of vehicles used for hauls of 25 miles or more; F, Weekly averages; G, Transportation by truck across State lines.

These tables are subdivided by commodity, size of vehicle, commodity and type of service and mileage blocks.

152. U. S. INTERSTATE COMMERCE COMMISSION. BUR. OF TRANSPORT ECONOMICS AND STATISTICS. Carload waybill statistics. Washington, 1949-1959. Interstate Com. Comn. Libr.

Based on 1 percent sample of terminated carload waybills filed by Class I railroads. Various series are issued quarterly and annually. The following are of interest: MB-1, Mileage block distribution, traffic and revenue by commodity class, territorial movement, and type of rate, products of agriculture. 1958. MB-2, Mileage block distribution, traffic and revenue by commodity class, territorial movement, and type of rate, animals and products. 1958. MB-6, Mileage block progressions, traffic and revenue by commodity groups and classes. 1958. SS-2, State-to-State distribution, products of agriculture. 1958. SS-3, State-to-State distribution, animals and products. 1958. SS-7, Tons of revenue freight originated and tons terminated by States and by commodity class. 1958.

Information contained in these series include revenue analysis, length of haul, average load distribution between rate territories and States, and type of rate by principal commodity classes and groups.

153. U. S. INTERSTATE COMMERCE COMMISSION. BUR. OF TRANSPORT ECONOMICS AND STATISTICS. Freight commodity statistics; Class I railroads in the United States for the year ended December 31, 1959. Washington, 1960. 252 p. (Its Statement 60100). 168 F88

Issued annually.

Seven tables make up the contents, of which table 7, p. 35-252, shows tons of revenue freight and freight revenue for each railway by individual classes of commodities. There are figures for 54 products of agriculture, including number of carloads, number of tons, and gross freight revenue in dollars. Similar figures are given for animals and animal products.

154. U. S. INTERSTATE COMMERCE COMMISSION. BUR OF TRANSPORT ECONOMICS AND STATISTICS. Intercity ton-miles, 1939-1954. Washington, 1956. 11 p. (Its Statement 568). Libr. Cong.

A long-period comparison by form of motor transportation to permit analysis of trends.

155. U. S. INTERSTATE COMMERCE COMMISSION. BUR. OF TRANSPORT ECONOMICS AND STATISTICS. Motor carrier freight commodity statistics. Class I common and contract carriers of property for the year ended December 31, 1958. Washington, 1959. 25 p. (Its Statement 596). 168 M85

Figures are shown separately for the United States, and the eastern and western districts, and for each of nine regions. Products of agriculture and animals and animal products are included. Tables show number of truckload shipments, number of tons, and gross freight revenue in dollars.

156. U. S. INTERSTATE COMMERCE COMMISSION. BUR. OF TRANSPORT ECONOMICS AND STATISTICS. Transport statistics in the United States for the year ended December 31, 1958 ... subject to the Interstate Commerce Act. Washington, 1959. 9 v. Bur. Railway Econ. Libr.

Issued annually.

Pt. I, Railroads, their lessors and proprietory companies; Pt. 4, Electric railways; Pt. 5, Carriers by water; Pt. 7, Motor carriers; Pt. 8, Freight forwarders; Pt. 9, Private car lines.

Includes statistics on equipment, and on tonnage of freight revenue, by commodity groups.

FREIGHT RATES

157. BOWLING, C. B. Transportation rates and polices. In U. S. Agricultural Research Admin. Pricing and Trade, p. 130-146. Washington, 1952. 1.98 P932

Includes remarks by J. C. Winter.

A discussion of freight rates, their classification, how they are determined, and the high rates borne by farm products. Includes comments on the Interstate Commerce Commission and how it operates.

158. CHURCH, D. E. Effect of increases in freight rates on agricultural products. U. S. D. A. C. 847,39 p. Apr.1950. 1 Ag84C

Rate increases on such products as fresh fruits, vegetables, and cotton are discussed. States that increases in transportation rates by a uniform percentage across the board, tend to decrease prices

in nearby markets, and to increase prices at distant markets. Selective reductions in railroad rates have been made and some food processors have decentralized their operations.

159. CHURCH, D. E. Freight-rate indexes for fruits and vegetables. U. S. Bur. Agr. Econ. Mktg. & Transportation Situation MTS-67:5-13. Dec.1948. 1.941 M8M34
Presents specific measurements of railroad rate levels for fruits and vegetables, for the period from 1913 to 1948.

160. CHURCH, D. E., and REEVES, G. Freight rate indexes for wheat and cotton, 1913-1949. U. S. Bur. Agr. Econ. Mktg. & Transportation Situation MTS-70:6-10. Mar.1949. 1.941 M8M34
Contains tables of index numbers, and origin and destination points.

161. CHURCH, D. E. Railroad freight rates increase. U. S. Bur. Agr. Econ. Mktg. & Transportation Situation MTS-59:6-12. Jan.-Feb. 1948. 1.941 M8M34
Reviews the postwar readjustments, and the rate increases granted by the Interstate Commerce Commission.

162. CHURCH, D. E. Trend of average transportation charges differs from trend of freight rates. U. S. Bur. Agr. Econ. Mktg. & Transportation Situation MTS-93:12-17. Feb.1951. 1.941 M8M34
The differences between the trends of rates and of average transportation charges are well illustrated in the case of oranges, potatoes, and butter.

163. DEWEY, D. A reappraisal of F. O. B. pricing and freight absorption. South. Econ. J. 22(1):48-54. July 1955. 280.8 So84
Concludes that since some departure from f. o. b. pricing is a necessary byproduct of workable competition, little is gained by attempting to eliminate noncollusive freight absorption or phantom freight.

164. DEWOLFE, M. R. The level of rail freight rates on farm products, 1952-1957. U. S. Agr. Mktg. Serv. Mktg. & Transportation Situation MTS-131:41-42. Nov.1958. 1.941 M8M34
Annual freight rate indexes for selected agricultural commodities.

165. DEWOLFE, M. R. Recent changes in rail freight rates on farm products. U. S. Agr. Mktg. Serv. Mktg. & Transportation Situation MTS-134:40. July 1959. 1.941 M8M34
A table shows annual rail freight rate indexes for selected agricultural commodities, 1945 and 1952-1958.

166. LEAVENS, D. C., and RHODES, R. G. Factors affecting freight rates on agricultural commodities: the railroad passenger deficit. Washington, U. S. Prod. & Mktg. Admin., 1951. 79 p. 1.956 T68F11
Appendix tables, p. 35-79.
Under present rate structures, the passenger deficit is charged to freight operations. Suggests the elimination of passenger trains operated at a direct deficit as a way of reducing railroad costs.

167. LIMMER, E. Chief factors underlying general changes in rail freight rates, with special reference to farm products, 1910-51. Washington, U. S. Bur. Agr. Econ., 1951. 58 p. 1.941 M2C43
Deals with the Interstate Commerce Commission's application of

standards which guide it to adequacy of earnings, value of service. agricultural economic conditions, and the relationships between freight rates and prices.

168. LIMMER, E. The elasticity of demand for railroad transportation of Florida produce. J. Farm Econ. 37(3):452-460. Aug.1955. 280.8 J822
Analyzes the relationships between rail and truck rates in 1952, and each carrier's share of the traffic at important markets for each of eight fresh fruits and vegetables.

169. LIMMER, E. Higher freight rates and other transport developments. U. S. Agr. Mktg. Serv. Mktg. & Transportation Situation MTS-121:12-19. Apr.26,1956. 1.941 M8M34
Shows how recent increases in rates charged by railroads, water carriers, freight forwarders, and motor carriers will affect the transport of agricultural products.

170. LIMMER, E. Railroad and truck rates and movements of fresh fruits and vegetables from Florida. U. S. Agr. Mktg. Serv. AMS-53,27 p.,tables. June 1955. A280.39 M34Am
Total costs of shipping by rail were generally higher than costs by truck for most of the produce. Railroads and trucks differed as to the share of the traffic they handled, these shares varying according to commodity and market.
Table 3 shows percentage of total rail unloads by markets for beans, cabbage, celery, corn, grapefruit, oranges, potatoes, and tomatoes.

171. LIMMER, E. Railroad freight rates and prices of agricultural products, 1913-50. U. S. Bur. Agr. Econ. Mktg. & Transportation Situation, MTS-83:6-12. Apr.1950. 1.941 M8M34
Surveys changes in freight rates as related to prices during World War I and II, during the nineteen twenties, and the depression. The outlook is for lower farm prices and for stable or higher freight rates.

172. NELSON, R. A. A view of motor carrier pricing. Pacific Nowest. Business 17(1):5-13. Oct.1957. Wash. U. Libr.
States that motor common carriers could benefit small shippers and meet competition of nonregulated carriers by shifting from rates based on railroad scales to rates based on average costs. Considers the impact which competitive, nonregulated transportation has had on motor carriers and shippers.

173. PETERS, C. W. Costs of hauling fresh fruits and vegetables in the Honolulu market. Hawaii Agr. Col. Agr. Econ. B. 9,16 p. May 1955. 280.9 H312
Costs are for cartage from the docks and delivery to retail stores and institutional outlets. Shows truck expense and labor costs per mile and per 100 pounds, hours and miles of operation per truck, number of trips and load per trip, and ratio of load to capacity.

174. REESE, R. B. Methods of computing rail freight-rate indexes for farm products. U. S. Agr. Mktg. Serv. AMS-209,45 p., tables. Reissued Sept.1957. A280.39 M34Am
Originally published by U. S. Bureau of Agricultural Economics, in October 1953. A289.22 Ec7
Explains the basis for the index series for wheat, cotton, fresh fruits and vegetables, livestock and meats, and a combination rail freight rate index for farm products.

175. REESE, R. B. Revised rail freight rate index number series. U. S. Bur. Agr. Econ. Mktg. & Transportation Situation MTS-110:11-17. July-Sept.1953. 1.941 M8M34
Includes two tables. Shows the sharp postwar increases in rates. Except for meats, the series of index numbers go back to 1913, covering wheat, cotton, livestock, meats, fresh fruits and vegetables, and a combined index.

176. SEALS, D. Can the railroads find security behind their "Maginot Line" of long-haul traffic? Kern Co. Potato Growers Assoc. Ybk. 11:73,75,77,79,81,83. Mar.21,1955. 286.3759 K45A
Suggests that railroads can attract additional traffic by having more modern refrigerator cars, improving their schedules, adopting uniform and simpler rate structures for fruits and vegetables, and reducing the passenger deficit which falls almost entirely on the carload freight traffic.

177. SMITH, R. T. Indexes of average freight rates on railroad carload traffic 1948-56. Washington, Interstate Com. Comn. Bur. of Transport Economics and Statistics, 1958. 14 p. (Its Statement R1-1). Bur. Railway Econ. Libr.

178. SPERLING, C., and LINNENBERG, C. C. Recent developments in freight rates and transport policy. U. S. Agr. Mktg. Serv. AMS-293,42 p. Jan.1959. A280.39 M34Am
Reprinted from the Marketing and Transportation Situation MTS-129: 14-17, April 1958, and MTS-131:36-41, November 1958. 1.941 M8M34
Contents: Recent rail freight rate increases; Transportation charges; The Transportation Act of 1958 (Public Law 85-625); Level of rail freight rates on farm products, 1952-57.

179. SPERLING, C., and LINNENBERG, C. C. Recent rail freight rate increases. U. S. Agr. Mktg. Serv. Mktg. & Transportation Situation MTS-129:14-17. Apr.1958. 1.941 M8M34
Indicates the percentage increase for products of agriculture and animals and products.

180. SPERLING, C. Transportation charges. U. S. Agr. Mktg. Serv. & Transportation Situation MTS-131:12-14. Nov.1958. 1.941 M8M34
Summarizes the freight rate increases allowed and disallowed by the Interstate Commerce Commission on September 9, 1958.

181. STANFORD RESEARCH INSTITUTE. Transportation and handling costs of selected fresh fruits and vegetables in the San Francisco Bay terminal market area. U. S. D. A. Mktg. Res. Rpt. 2,65 p. May 1952. 1 Ag84Mr
Total costs were measured f.o.b. point of origin to wholesale dealers in Oakland and San Francisco by use of published tariffs or motor carrier charges plus the costs developed in the study. Also, the cost of each of the major steps in the transporting and receiving process after arrival at the terminal market and until the products were received on the floor of the primary or secondary handler, were measured.

182. THOMPSON, W. H. Postwar railroad freight rate increases and agriculture. J. Mktg. 15(3):298-306. Jan.1951. 280.38 J82
Indicates that rate level cases have created a number of unreasonable rate relationships and have raised charges above the levels that some agricultural traffic can bear. Suggests that railroad

management might give more attention to the possibility of competitive rate scales.

183. U. S. INTERSTATE COMMERCE COMMISSION. Ex Parte No. 148. Increased railway rates, fares, and charges, 1942. Submitted January 14, 1942. Decided March 2, 1942. U. S. Interstate Com. Comn. Rpt. 248:545-625. 1942. U. S. D. A. Law Libr.

Granted a general increase in rates and charges of 6 percent, except on commodities specified.

Further hearings and findings on Ex Parte 148 are reported in U. S. Interstate Com. Comn. Rpt. 255:357-418. Apr.6,1943; 256:502-506. Nov.8,1943; 258:455-458. May 12, 1944; 259:159-200. Dec.12,1944.

184. U. S. INTERSTATE COMMERCE COMMISSION. Ex Parte No. 162. Increased railway rates, fares, and charges, 1946. Ex Parte No. 148. Increased railway rates, fares, and charges, 1942. Submitted October 25, 1946. Decided December 5, 1946. U. S. Interstate Com. Comn. Rpt. 266:537-623. 1946. U. S. D. A. Law Libr.

An interim report was made on June 20, 1946 and may be found in U. S. Interstate Com. Comn. Rpt. 264:695-752. 1946.

Basic freight rates were increased by 20 to 25 percent except as otherwise specifically provided.

185. U. S. INTERSTATE COMMERCE COMMISSION. Ex Parte No. 166. Increased freight rates, 1947. Submitted December 20, 1947. Decided July 27, 1948. U. S. Interstate Com. Comn. Rpt. 270: 403-472. 1948. U. S. D. A. Law Libr.

Three interim decisions granting temporary increases are found in the following: U. S. Interstate Com. Comn. Rpt. 269:33-56. Oct.13, 1947; 270:81-92. Dec.29,1947; 270:93-104. Apr.13,1948.

In its decision of July 27, 1948, the Commission granted basic freight rate increases, subject to the maximum specified for stated commodities, ranging from 20 to 30 percent in the eastern, southern, and western territories.

Upon reconsideration and rehearing of Ex Parte 166, the Commission modified its findings of 1948 in certain western territories and prescribed maximum reasonable rates therein. Decision is found in U. S. Interstate Com. Comn. Rpt. 279:303-317. Nov.6,1950.

186. U. S. INTERSTATE COMMERCE COMMISSION. Ex Parte No. 168. Increased freight rates, 1948. Submitted May 21, 1949. Decided August 2, 1949. U. S. Interstate Com. Comn. Rpt. 276:9-122. 1949. U. S. D. A. Law Libr.

Interim increases of 4 to 6 percent, were granted in basic freight rates, as decided in U. S. Interstate Com. Comn. Rpt. 272:695-720. Dec.29,1948.

In its final report on August 2, 1949, the Commission authorized basic freight rate increases of from 8 to 10 percent, except for maximum increases on specific commodities or groups of commodities.

Findings were modified in a decision of November 6, 1950 as shown in U. S. Interstate Com. Comn. Rpt. 279:303-317. 1950.

187. U. S. INTERSTATE COMMERCE COMMISSION. Ex Parte No. 175. Increased freight rates, 1951. Submitted February 29, 1952. Decided April 11, 1952. U. S. Interstate Com. Comn. Rpt. 284:589-673. 1952. U. S. D. A. Law Libr.

Authorized an increase of 15 percent in basic freight rates, subject to certain exceptions and stated maxima. The increases took the form of surcharges to be added to the freight bills.

Interim and later findings on Ex Parte 175 are found in the following: U. S. Interstate Com. Comn. Rpt. 280:179-198. Mar.12,1951; 281: 557-649. Aug.2,1951; 289:395-444. July 29, 1953; 297:17-51. Oct.17, 1955.

188. U. S. INTERSTATE COMMERCE COMMISSION. Ex Parte No. 196. Increased freight rates, 1956. Submitted February 22, 1956. Order entered March 2, 1956. Report filed May 7, 1956. U. S. Interstate Com. Comn. Rpt. 298:279-349. 1956. U. S. D. A. Law Libr.
Found that a general increase of 6 percent with certain exceptions, would be just and reasonable.

189. U. S. INTERSTATE COMMERCE COMMISSION. Ex Parte No. 206. Increased freight rates, eastern and western territories, 1956. Decided December 17, 1956. U. S. Interstate Com. Comn. Rpt. 299:429-459. 1956. U. S. D. A. Law Libr.
Granted an emergency increase of 5 to 7 percent in basic freight rates, subject to stated exceptions, and limitations.

190. U. S. INTERSTATE COMMERCE COMMISSION. Ex Parte No. 206. Increased freight rates, eastern, western, and southern, territories, 1956. Decided August 6, 1957. U. S. Interstate Com. Comn. Rpt. 300:633-711. 1957. U. S. D. A. Law Libr.
Authorized general freight rate increases ranging from 9 to 14 percent as defined in Appendix B, subject to the provisions, limitations, and exceptions set forth therein.

191. U. S. INTERSTATE COMMERCE COMMISSION. Ex Parte No. 212. Increased freight rates, 1958. Decided February 11, 1958, and September 9, 1958. U. S. Interstate Com. Comn. Rpt. 302:665-700; 304:289-383. 1958. U. S. D. A. Law Libr.
Granted specific increases in rates including those on the products of agriculture, animals and products, grains, and fresh fruits and vegetables, with stated limitations and exceptions.

192. WAUGH, F. V., and PURCELL, M. R. The farmer's concern with transportation policy. U. S. Bur. Agr. Econ. Mktg. & Transportation Situation MTS-105:18-27. Mar.-Apr.1952. 1.941 M8M34
On postwar freight rate increases and their economic effects, particularly on farm prices and production and on interregional competition.

193. WILSON, G. L. Railroad freight rate structure. Washington, Traffic Serv. Corp., 1951. 284 p. (Fundamentals of Freight Traffic, v. 2). Libr. Cong.
Describes the rate structures of each territorial subdivision of the United States, the interterritorial rate structure, rail-water rates, the import and export freight rates, and rate increases from 1932 to 1950.

SHIPPING CONTAINERS

194. BEMIS, K. P. Pallet containers, a new handling system. United Fresh Fruit & Veg. Assoc. Ybk. 1959:134-136. 280.3939 Un3
Describes their construction, advantages, applications in the potato industry and in handling fresh fruits and vegetables.

195. BRETZ, R. Recent trends—what we find at destination. Conf. Transportation Perishables. Proc. 1954:133-138. 280.39 C765
Use of fiberboard containers for shipping fruits and vegetables, and better methods of loading and refrigeration results in better quality products at terminal.

196. CAREY, L. C. Containers in common use for fresh fruits and vegetables. U. S. D. A. Farmers' B. 2013,61 p.,illus. Feb.1950. 1 Ag84F
Sets forth under each commodity, the unofficial standard containers most commonly used in shipping. Sizes, shapes, and dimensions are given.

197. DAHILL, E. J. Recent developments and trends in containers and loading. Conf. Transportation Perishables. Proc. 1953:91-96. 280.39 C765
Changes in size of containers, expanding use of fiberboard, ventilation of containers, and research on containers.

198. FIELDING, A. M. Containers and loading of perishables at shipping point. Conf. Transportation Perishables. Proc. 1956:40-42. 280.39 C765
Recommends changes in fiberboard and wooden containers to improve them.

199. GUILLOU, R. Engineering aspects of new container development. Conf. Transportation Perishables. Proc. 1958:93-97. 280.39 C765
Discusses design and use of containers from the standpoint of packing, storage, and transportation, with reference to bulging of boxes, cooling, bruising, and container breakage.

200. HALL, H. M. Standard sizes of shipping containers for cargo interchange. Mech. Engin. 80(1):44-50,illus. Jan.1958. 291.9 Am3J
On unit loads, pallet containers, cargo containers, bulk shipping containers, and vantainers. A vantainer is a demountable truck body that can be used interchangably on railroad cars, highway trucks, or trailer chassis. There is a growing interchange between carriers in handling small quantities of freight.

201. HEEBINK, T. B. Bin pallets for agricultural products. U. S. Forest Prod. Lab. Rpt. 2115,34 p.,illus. June 1958. 1.9 F761R
Discusses design, size, protection against bruising, materials used, and construction practices for farmers and other fabricators of bin pallets.

202. KELLICUTT, K. Q., and LANDT, E. F. Basic design data for the use of fiberboard in shipping containers. U. S. Forest Prod. Lab. Rpt. 1911,23 p. Ref. Nov.1951. 1.9 F761R
Studied correlation between certain strength properties of a box and those of its components, and methods to predict the compressive strength of corrugated fiberboard boxes.
Also in TAPPI 35(9):398-402. Sept.1952. 302.8 T162

203. LYNCH, T. R. National shipping picture. Conf. Transportation Perishables. Proc. 1956:45-50. 280.39 C765
Changes in containers for fruits and vegetables.

204. MOORE, C. B. Containers, loading and refrigeration—vegetables and melons. Conf. Transportation Perishables. Proc. 1956: 30-34. 280.39 C765
States that over 90 percent of carrots and lettuce are now shipped in fiberboard containers. Comments on experiments with containers for celery, and melons. A tremendous amount of the breakage and bruising of commodities is the fault of the carrier and not the shipper.

205. PURCELL, R. I. Lift-truck warehousing; reviewing an effective handling system. United Fresh Fruit & Veg. Assoc. Ybk. 1959:200-208. 280.3939 Un3
Discusses the "fork lift-pallet system", the advantages and the planning of a palletized program, arrangement of pallets, types used, unit load standards, use of pallet rollers, methods of stacking pallets, operating regulations, and plant arrangement for a forklift operation.

206. SMITH, T. B., and BROWNING, J. W. Fresh fruit and vegetable prepackaging - Northeastern region. Operating season, 1954-1955. U. S. D. A. Mktg. Res. Rpt. 154, 43 p., tables. Feb. 1957. 1 Ag84Mr
Consists almost entirely of tables arranged alphabetically by the name of fruit or vegetable, and divided into six main sections for each commodity. One section is entitled "Master Containers" and gives type (fiberboard, wood, wirebound crates, cardboard), costs, consumer packages in each master container, and cost of ice bag used in master container.

207. SMITH, T. B., and VALLDEJULI, J. J. Fresh produce prepackaging practices in the United States. U. S. D. A. Mktg. Res. Rpt. 341, 111 p., illus. July 1959. 1 Ag84Mr
A survey of 217 plants in 35 States covering 35 vegetables and 8 fruits. Includes information on master containers by type (fiberboard boxes, wooden boxes, wirebound crates, banana boxes, baskets, meshbags, lugs, berry boxes, polyethylene bags, and paper bags), and costs for new and used containers for several commodities.

208. U. S. PRODUCTION AND MARKETING ADMIN. Conversion factors and weights and measures for agricultural commodities and their products. Washington, 1952. 96 p., tables. 1.956 A2C762
Containers most commonly used for fresh fruits, p. 56-58; Containers most commonly used for fresh vegetables and melons, p. 69-71. These tables give size, type and approximate weight of containers for each vegetable and fruit.

209. WHITE, F. J. Containerization in bulk material handling. Nowest. Miller (Milling Prod. Sect.) 262(15):1a, 4a, 6a-8a, 10a. Oct. 13, 1959. 298.8 N81
Discussion is based primarily on the "Tote System" of portable containers. The Tote bin is 42 x 48 inches and is suitable for truck or rail shipment. Describes the techniques and equipment used in filling the bins, the installations and operations involved in shipping by rail and by truck for specific plants handling sugar, coffee, flour, milk powder, and non-agricultural products.

210. ALBERT, G. D. Truck-trailer refrigeration for frozen foods. Quick Frozen Foods 11(8):98-100,142,174. Mar.1949. 389.8 Q4
Discusses the various types of refrigeration used in vans and trucks, and the greater use of trucks for frozen foods because of faster service, more in-transit stops, and constant low temperature.

211. ANDERSON, G. E., and others. Railway refrigerator cars. In American Society of Refrigerating Engineers. ASRE Air conditioning, refrigerating data book; refrigeration applications, v. 1, no. 1, 1959. New York, 1958. p.3301-3317. Ref. 295.9 Am32Ref
B. E. Duff, W. H. Redit, and H. G. Strong, joint authors.
Discusses types of refrigerator cars, types of protective services, sources of refrigeration, refrigerator car design and construction, supplementary equipment, and mechanical refrigeration equipment.

212. ASSOCIATION OF AMERICAN RAILROADS. REFRIGERATOR CAR RESEARCH. A. A. R. Summary report no. 31, reporting separately heater service rendered in 129 individual car tests on refrigerator carloads of cold storage apples and pears originating in the Pacific Northwest and moving eastward principally to Chicago, Ill. during the winter season 1948-1949. Final report. Chicago, 1949. 161 p.,illus.,tables,charts. 295 As7A
Tests were made to determine the existing types of heaters under day to day operating conditions in standard refrigerator end bunker cars without fans. Consists largely in drawings, photographs, charts, and tables.

213. CLAYPOOL, L. L., and others. Air transportation of fruits, vegetables and cut flowers: temperature and humidity requirements and perishable nature. U. S. Agr. Mktg. Serv. AMS-280,27 p. Oct. 1958. A280.39 M34Am
L. L. Morris, W. T. Pentzer, and W. R. Barger, joint authors.
Originally issued as H. T. & S. Office Report by the Bureau of Plant Industry, Soils, and Agricultural Engineering. (1.9 P772Ht)
Also reprinted with the title How to ship perishables by air, in Refrig. Engin. 60(4-5):357-361,412,414,480-481. Apr.-May 1952. 295.9 Am32J
Presents detailed recommendations for the handling of various fruits, flowers, and vegetables. The effect of temperature on the rate of deterioration is stressed and the effects of water loss, air pressure, maturity, and original quality are considered.

214. COLBERT, J. W., LENTZ, C. P., and ROOKE, E. A. Effect of bunker ice salt concentration on temperature. Refrig. Engin. 59(10):960-962. Oct.1951. 295.9 Am32G
The redesigned bunker system produced lower air temperatures than the standard bunker system at all concentrations, with a savings in salt.

215. DIETERICH, R. H. Refrigerated trucks. Milk Dealer 45(6): 46-47,62-64,66,68-70. Mar.1956. 44.8 M595
Describes several refrigerating units and their relative merits. Also discusses larger loads, insulation, and bulkhead doors.

216. ELFVING, T. M. How to solve moisture problems in low temperature railroad transportation. Refrig. Engin. 63(6):48-56,124-125. June 1955. 295.9 Am32J
Study of tests made on moisture pickup of mechanically refrigerated railroad cars and its effects on insulation.

217. EMERSON, H. C., and BURR, K. O. Good transport equipment, vital need of the frozen food industry. Good Packaging 17(7): 154,156-161,195,illus. July 1956. 280.38 G59
Lack of equipment to protect quality of frozen foods in transit, and rising freight rates are discussed. Includes illustrations of interiors and refrigerating units for trucks and express cars.

218. GORMAN, E. A. Produce protection in rail transit. Refrig. Engin. 58(7):668-672,710,712. July 1950. 295.9 Am32J
A discussion of several ways to precool fresh fruits and vegetables and keep them cool during shipment to market.
Also in Appleland News 14(9):17-20. Ref. Sept.1950. 80 Ap53

219. GUILFOY, R. F. A curtain to help maintain temperatures in local refrigerated delivery trucks. U. S. D. A. Mktg. Res. Rpt. 176, 21 p.,illus. May 1957. 1 Ag84Mr
Summary in Ice Cream Rev. 41(2):26,49-50. Sept.1957. 389.9 Ic22
Describes a curtain, consisting of two weighted halves and made of a transparent and tough polyester plastic film reinforced with neoprene-coated nylon. It was tested in five trucks hauling frozen foods and meats. The use of this curtain resulted in a smaller rise in product temperature, eliminated dripping from "cold plates", and abolished the need for dry ice. Instructions are given for making and for installing the curtain.

220. GUILFOY, R. F., and JOHNSON, H. D. Suggested methods for checking temperatures of fresh and frozen food shipments. U. S. D. A. Mktg. Res. Rpt. 150,9 p.,illus. Dec.1956. 1 Ag84Mr
Types of thermometers, precautions to be observed, and instructions for taking temperatures of frozen foods, fresh fruits, fresh vegetables, dairy products, and poultry. Temperatures should be checked before products are loaded, and again upon arrival at destination.

221. GUILLOU, R. Coolers for fruits and vegetables. Calif. Agr. Expt. Sta. B. 773,66 p.,illus. Ref. July 1960. 100 C12S
Includes a section cooling methods in rail cars, p. 13-15. It covers carcooling by ordinary spacing, by chimney suction, and by forced-air cooling. Four paragraphs are devoted to cooling in trucks.

222. HALL, J. D., and others. Transportation test of dry ice refrigerated truck trailer, Florida to Chicago, May 1951. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 252,9 p.,tables, charts. July 1951. 1.9 P772Ht
A. B. Walton, H. D. Johnson, and W. H. Redit, joint authors.
The unit tested was installed in an insulated trailer and consisted of a dry ice bunker with finned surface and thermostatically controlled air circulation.

223. HINDS, R. H., JOHNSON, H. D., and HALDEMAN, R. C. A performance test of refrigerated rail cars transporting frozen food. U. S. D. A. Mktg. Res. Rpt. 182,26 p. June 1957. 1 Ag84Mr

Compared the performance of two types of mechanical refrigerated rail cars and one standard water-ice-and salt refrigerated car hauling packaged frozen corn from Minnesota to New Jersey.

224. JOHNSON, H. B. The fan car-fables and facts. Tex. Citrus & Veg. Growers & Shippers Annu. Mtg. 12:151,153,155. 1954. 280.39 T313Y
On the advantages of fan cars for transporting perishables. Cites shipping test experience with lettuce, tomatoes, and carrots.

225. JOHNSON, H. D., and others. Heat transfer measurements on refrigerated-food trailers. U. S. Agr. Mktg. Serv. AMS-250,12 p. June 1958. A280.39 M34Am
J. C. Winter, C. W. Phillips, J. W. Grimes, and P. R. Achenbach, joint authors.
U. S. National Bureau of Standards, cooperating.
Recommended methods of measuring temperature are described as are the procedures used in the metering heat sink method for rating refrigerated trailers.

226. JOHNSON, H. D., and BREAKIRON, P. L. Protecting perishable foods during transportation by truck. U. S. D. A. Agr. Handb. 105,70 p.,illus. Dec.1956. 1 Ag84Mr
Refrigeration, and preparation and loading of vehicle are considered, followed by a short section on each of 57 fresh fruits and vegetables, giving information on recommended protective services, loading methods, containers, and ventilation of trucks. Also covers frozen foods, meats, dairy and poultry products, and canned food with tables of freezing temperatures for injury to each.

227. JOHNSON, H. D. Refrigeration tests in transporting fresh and frozen agricultural products by motortruck. Milk Indus. Found. Conv. Proc. 47(Motor Vehicle Sect.):24-35. 1955. 44.9 In8
Commodity and air temperatures inside the truck trailers were recorded in loads of citrus concentrate and improvement in circulation of air by using a return air duct was recommended. Other studies involved the method of loading frozen turkeys, dry ice refrigeration of hanging beef, and a new type of mechanical refrigeratin unit.

228. JOHNSON, H. D., and others. Test of a refrigerator car equipped with dry ice system of refrigeration (at Potomac Yards, Alexandria, Va., January 11-22, 1952). Washington, U. S. Prod. & Mktg. Admin. Mktg. & Facil. Res. Br., 1952. 14 p. 1.956 M343T28
M. V. Gerrity, J. T. Worthington, and W. H. Redit, joint authors.
Frozen peas were used in a transcontinental shipment during extremely warm weather to determine the ability of a dry ice system to protect the food.

229. KELLEY, J. N. Know your modern refrigerator car and use it. United Fresh Fruit & Veg. Assoc. Annu. Conv. 45:52-53,55-59. 1949. 280.3939 Un3
Contains a detailed sectional drawing and review of the principal features and innovations of the modernized refrigerator car.

230. KELLEY, J. N. The refrigerator car; its relationship to loss and damage claims. United Fresh Fruit & Veg. Assoc. Annu. Conv. 53:119-122. 1957. 280.3939 Un3

Tells of improvements adopted in rail cars and submits recommendations for further improvement. Rough handling in transit is considered the greatest cause of losses.

231. LUTZ, J. M., FINDLEN, H., and KAUFMAN, J. Operating fans in cars of produce after arrival at terminal markets. U. S. D. A. Mktg. Res. Rpt. 206, 9 p. Nov. 1957. 1 Ag84Mr
Studies were made to test the effectiveness of permanently installed fans in both iced and heated cars in maintaining desirable temperatures, especially in top and bottom layers of loads.

232. MCKILLOP, A. A., MORRIS, L. L., and BARGER, W. R. Thermostatic control for fresh perishables in ice-refrigerated railroad cars. Indus. Refrig. 133(5):15-18, 52. Nov. 1957. 295.8 Ic2
Describes equipment and performance tests.

233. MECHANICAL reefers get traffic. Railway Age 148(6):14-15, 17, 19, 22-24, 26. Feb. 8, 1960. 288.8 R136
The mechanical refrigerator car fleet on United States railroads has more than quadrupled since 1955. Tells of improvements and lists number of cars in service or on order, by carriers.

234. MULVIHILL, C. A. Transit refrigeration. Conf. Transportation Perishables. Proc. 1954:157-159. 280.39 C765
On the development of the modern refrigerator car, and the various types of services offered by the railroads to the shipper of fruits and vegetables.

235. MUNTER, A. M., BYRNE, C. H., and DYKSTRA, K. G. A survey of times and temperatures in the transportation, storage and distribution of frozen foods. Food Technol. 7(9):356-359. Sept. 1953. 389.8 F7398
Temperature and handling conditions in frozen food distribution from public warehouses to retail cabinets in three major markets were surveyed. Air and product temperatures are given for each phase of distribution.

236. PENNEY, R. W., and GUILFOY, R. F. Laboratory tests of refrigerator cars for perishable foods. U. S. D. A. Mktg. Res. Rpt. 365, 22 p., illus. Sept. 1959. 1 Ag84Mr
This study found a wide variation in the insulating efficiency or heat transmission rate of seven mechanically refrigerated cars tested. A method is given for estimating the time required to precool a car from ambient temperature to a desired level before loading.

237. PENTZER, W. T. Performance tests on refrigerator cars. Food Technol. 3(12):410-415, illus. Ref. Dec. 1959. 389.8 F7398
Topics discussed are precooling service, refrigeration in transit by bunker icing, body icing, standard refrigeration and heavy salting of fan cars for frozen food, ventilation and heater service.

238. PENTZER, W. T. Refrigeration of fruits and vegetables in transit. Conf. Transportation Perishables. Proc. 1953:41-48, tables. 280.39 C765
Tables show desirable transit temperature for 12 fruits, and 19 vegetables, and calculations of refrigeration required to remove field heat and vital heat from a carload of grapes and a carload of lettuce, and calculation of heat leakage.

239. PENTZER, W. T. Temperatures required by fruits and vegetables after harvest. Food Technol. 5(10):440-442. Oct.1951. 389.8 F7398
Optimum temperatures for transportation and storage are discussed, and the effects of other temperatures are noted.

240. PETERSON, W. E. Refrigeration of delivery trucks. Refrig. Engin. 59(4):351-353,395-396. Apr.1951. 295.9 Am32J
Various cooling methods, including mechanical refrigeration systems are described.

241. PHILLIPS, C. W., and others. A rating method for refrigerated trailer bodies hauling perishable foods. U. S. D. A. Mktg. Res. Rpt. 433,52 p.,illus. Sept.1960. 1 Ag84Mr
W. F. Goddard, P. R. Auchenback, H. D. Johnson, and R. W. Penney, joint authors.
In cooperation with the National Bureau of Standards, Quartermaster Research and Engineering Command of the Department of the Army, and the Truck-Trailer Manufacturers Association.
Reports on road tests and laboratory tests made on several typical refrigerated trailer bodies, and recommends a standard method of testing refrigerated trailers.

242. PHILLIPS, C. W., REDIT, W. H., and STRONG, H. G. Trucks and trailers. In American Society of Refrigerating Engineers. ASRE Air conditioning, refrigerating data book; refrigeration applications, v. 1, no. 1, 1959. New York, 1958. p. 3201-3230. Ref. 295.9 Am32Ref
The 49 illustrations of such things as air ducts, fans installed in top of bunker, floor racks, refrigerating units, air circulation, and insulation clarify the text. Types of refrigerated trucks and trailers, body design and construction, types of refrigerating systems, mechanical refrigeration equipment, and computation of cooling loads are discussed.

243. PLUMMER, K. V. Latest developments in the railroad refrigerator car field. Conf. Transportation Perishables. Proc. 1958: 193-196. 280.39 C765
Discussion by H. C. Lindsay, J. D. Cochran, H. H. Kolbo, J. H. Grim, and T. Horton.
On mechanical refrigeration, continuously-operating fans, and size of cars.

244. PLUMMER, K. V. Mechanical refrigeration. Conf. Transportation Perishables. Proc. 1954:160-164. 280.39 C765
Improvements and trends in refrigerator car construction.

245. POLLAK, H. Unique refrigerated van pays for itself in two years. Refrig. Engin. 64(12):50-51,86,88. Dec.1956. 295.9 Am32G
Used in the distribution of meat products over varying distances.

246. PORTER, W. L. Occurrence of high temperatures in standing boxcars. U. S. Qmaster. Res. & Devlpmt. Center, Natick, Mass. Environmental Protect. Div. Tech. Rpt. EP-27,38 p. Ref. Feb.1956. 152.71 Oc1
The study determined the temperature distribution and occurrence of extreme temperatures within the air and the load of a steel boxcar at Yuma, Ariz., in the summer of 1953.
Also in Res. & Devlpmt. Assoc. Food & Container Inst. Proc.

7:116-140. 1954,pub.1955. 389.9 R313P

247. PORTER, W. L. Transportation problems—occurrence of high temperatures in standing and moving boxcars. U. S. Qmaster. Food & Container Inst. Armed Forces. Surveys Prog. Mil. Subsist. Prob. Ser. IV, Mil. Util. Foods 1:45-81. Mar.1955. 152.7 Su7Sm
Title of Series IV, Part 1 is Establishing optimum conditions for storage and handling of semiperishable items.
Reports on research done in 1953 on temperatures in cars at Yuma, Ariz., and Cameron Station, Va.

248. RANSOM, R. W. Does the mechanically refrigerated freight car do its job? Refrig. Engin. 62(7):51-54,90,92. July 1954. 295.9 Am32J
A packer and shipper of meat products answers "yes" based on his studies of requirements, systems available, and actual operations. Discusses car construction variation, car lengths, mechanical units, operating agreements, and results.

249. RANSOM, R. W. Mechanical reefers perform well. Natl. Provisioner 127(16):114-117. Oct.18,1952. 286.85 N21
Mechanically refrigerated railroad car is said to give excellent service, especially for meats. Comments on equipment, costs, humidity, and experience with the four makes of equipment available at that time.

250. REDIT, W. H. Refrigerated truck transport problems. Refrig. Engin. 61(5):514-518. May 1953. 295.9 Am32J
Control of heat leakage into truck by means of adequate blanket of cool moving air surrounding the load is of major importance in delivering a shipment at guaranteed temperature. Includes summary of tests on three mechanical and two dry ice units, all of which were new equipment.

251. SAYWARD, P. Refrigerated truck transportation. Conf. Transportation Perishables. Proc. 1956:89-94. 280.39 C765
Truck trailers and their equipment for temperature control are described.

252. STEGMAN, H. S. Methods of preventing transit losses. Rio Grande Val. Hort. Inst. Proc. 9:16-27. 1955. 81 L95
Suggests improvements in refrigerator cars, in icing and refrigeration, in handling of perishable goods, and in fruit and vegetable containers.

253. TAYLOR, C. W. Modern refrigerator car for fresh fruits and vegetables. United Fresh & Vegetable Assoc. Ybk. 1958:190-194. 280.3939 Un3
Deals with the development, ownership, types, and distribution of refrigerator cars on the 100th anniversary of their use. Mentions the special services needed for such fruits as bananas, the use of heavier insulation, ventilation, heater service, care of frozen foods, and car service regulation by the Interstate Commerce Commission.

UTILIZATION OF EQUIPMENT

254. ALLEGRI, T. H., and HERRICK, J. F. Materials handling in public refrigerated warehouses. U. S. Agr. Mktg. Serv. Mktg. Res. Rpt. 145,120 p.,illus. July 1957. 1 Ag84Mr

Tables show labor requirements for loading trucks and rail cars, each operation, such as open car, close car, remove shoring, place bridge plate, and place paper in car.
Sections deal with unloading from railroad cars and from highway trucks with comparative costs of each, removing from storage and loading into railroad cars and into trucks, with comparison of costs, by package types, for single-story and multistory warehouses, and by materials-handling equipment used.

255. BREAKIRON, P. L. Effect of heavier loading of rail shipments on the marketing of fresh fruits, vegetables, and melons. U. S. Agr. Mktg. Serv. Mktg. & Transporation Situation MTS-134:33-39. July 1959. 1.941 M8M34
Gives reasons for heavier loading, factors favorable and unfavorable to it, and steps to be taken by shippers, carriers, and receivers to get the maximum economic benefit from heavier loading.

256. COLLIER, J. T. The rails shift to "Piggyback". Pub. Util. Fortnightly 59(9):588-597. Apr.25,1957. 280.8 P966
A more efficient use of railroad and highway transportation facilities is resulting from continued expansion of trailer-on-flatcar operations. Offering better service for shippers and added revenues for the railroads, piggyback could have far-reaching effects on rates, costs, and our whole system of distribution.

257. HERRICK, J. F., and others. An analysis of some methods of loading out delivery trucks of produce wholesalers. U. S. D. A. Mktg. Res. Rpt. 15,39 p. May 1952. 1 Ag84Mr
S. B. Burt, M. R. Kercho, and A. Zagarella, joint authors.
Methods of reducing the costs of handling products through the warehouses of produce wholesalers were studied and six methods used in loading out delivery trucks were appraised.

258. HOFFMAN, S. S. Freight cars on the move. Natl. Indus. Conf. Bd. Business Rec. 8(7):258-261. July 1951. 280.9 N216Cb
On the shortages of freight cars and the steps taken to ease the shortages.

259. JAY, J. E. A method of measuring transit time for rail carloads of agricultural and other products. U. S. Agr. Mktg. Serv. AMS-339,10 p. Oct.1959. A280.39 M34Am
The primary target of the method is to calculate the average distance that all carloads on line move in 24 hours. It may be called "miles per day per loaded car." The number of days in transit is the average miles per carload haul divided by this average daily distance.

260. JOHNSON, H. B. Loading patterns for truckrail units. Tex. Citrus & Veg. Growers & Shippers, [Ybk.] 16:159-160,162,164. 1958. 280.39 T313Y
Report of six piggyback shipping tests to determine rates of cooling obtained in solid, open, or channeled loads of carrots, onions, grapefruit, and tomatoes.

261. JOHNSON, H. L. Piggyback transportation; an economic analysis. Ga. State Col. Business Admin. Studies Business & Econ. B. 1,54 p. Ref. May 1956. Libr. Cong.
Trailer-on-flatcar development and its economic effect on railroads, motor carriers, and society. Found that truck-rail haulage has advantages for motor carriers, railroads, shippers, and the

community-at-large. Historical development of trailer-on-flatcar movement as well as expected profitability of piggyback service is discussed.

262. KERCHO, M. R., HERRICK, J. F., and BURT, S. W. Use of recording and transcribing equipment in loading delivery trucks of produce wholesalers. U. S. D. A. Agr. Inform. B. 43,20 p.,illus. May 1951. 1 Ag84Ab
Use of the recording method described resulted in labor savings of $100 per week in the loading phase alone by eliminating the checker in each crew. Time studies indicated that the loading of delivery trucks is one of the most costly of all operations performed at the warehouses of service wholesalers.

263. KRIESBERG, M. Methods of handling and delivering orders used by some leading wholesale grocers. U. S. D. A. Mktg. Res. Rpt. 13,50 p. May 1952. 1 Ag84Mr
Studied ways of reducing and effectively controlling delivery costs, procedures for estimating the productivity of delivery truckdrivers, and for evaluating the overall delivery operation.

264. LEVIN, J. H., and GASTON, H. P. Equipment used by deciduous fruit growers in handling bulk boxes. U. S. Agr. Res. Serv. ARS-42-20,11 p. Aug.1958. A58.9 R31
Considers various attachments for tractors, bulk box dumpers, forklift trucks and similar equipment.
Includes illustrations and list of manufacturers.

265. LOWSTUTER, A. B., KELSEY, A. J., and HERRICK, J. F. The comparative efficiency of various arrangements of railroad tracks at stores in wholesale produce markets. U. S. D. A. Agr. Inform. B. 55,39 p. June 1951. 1 Ag84Ab
The ideal arrangement will provide sufficient car spaces with smallest outlay of capital and with shortest mean distance from car door to the stacking point in the store. Eleven track arrangements are discussed, but none would be ideal for all markets.

266. PORTER, P. H. Movement of highway trailers by rail. Pub. Util. Fortnightly 54(4):419-420. Sept.30,1954. 280.8 P966
Gives background of the Piggyback Case Interstate Commerce Commission Docket 31375, decided on July 30, 1954, and the essentials of the Interstate Commerce Commission's ruling.

267. PURCELL, M. R. Haulage of products from farms. U. S. Bur. Agr. Econ. Mktg. & Transportation Situation MTS-73:6-14. June 1949. 1.941 M8M34
Based on nationwide interview surveys, the study shows how commodities are moved off farms. The mode of transport was classified into three types: 1, Farm-owned equipment (trucks, trailers, and wagons); 2, For-hire equipment, and 3, Buyers' equipment.
Study also covers ownership of motortrucks and trailers, age of trucks, and motive power used to haul farm trailers.

268. SHAFFER, P., and ANDERSON, D. Unloading and receiving produce in retail food stores. U. S. D. A. Mktg. Res. Rpt. 129,13 p. Aug.1956. 1 Ag84Mr
Four methods of unloading and receiving were evaluated. The most efficient method was that by which produce was delivered on pallets, unloaded on pallets, and parked or stored on pallets.

269. SHOTT, J. G. Piggyback and the future of railroad transportation. Washington, Pub. Aff. Inst., 1960. 43 p., illus. Libr. Cong.
Concludes that a very considerable expansion in piggyback car loadings is in prospect in the next few years, and the trend in the loadings for agricultural commodities illustrates the growth in piggyback service.

270. SNITZLER, J. R. Improving the truck delivery operations of a wholesale grocer - a case study. U. S. D. A. Mktg. Res. Rpt. 127, 51 p., illus. June 1956. 1 Ag84Mr
Studied the efficiency of delivery operations of a firm in Baltimore, Md. Recommendations were made for changes in servicing small orders where delivery costs were high, review of labor expense on c. o. d. orders because of time spent in making collections, improvements in trip routing, improved methods of loading and unloading, changes in type of equipment used to save time and effort on part of driver, and the use of smaller trailers when the time comes for replacements.

271. WICKS, S. V. Guide for F F truckers. Quick Frozen Foods 20(8):333-334,336,338. Mar.1958. 389.8 Q4
Enumerates and describes equipment requirements for truckers of frozen foods. Tells how to record temperature at loading time, avoid claims for damaged goods by adequate safeguards, how to report refrigeration failure, and how to check for all vital information on the manifest.

AGRICULTURAL COMMODITIES

Dairy Products

272. AGNEW, D. B. How bulk assembly changes milk marketing costs. U. S. D. A. Mktg. Res. Rpt. 190, 91 p. Ref. July 1957. 1 Ag84Mr
Shows the effects of bulk assembly on milk quality and volume, on milk plant operations, on milk hauling, and on milk producers. Covers such cost items as refrigeration, labor, truck operating costs, equipment costs, electricity, and gives information on changes in collection routes and their ownership and control. The literature cited contains 344 items.

273. BABB, E. M., and BUTZ, W. T. Improving fluid milk distribution practices through economic-engineering techniques. Pa. Agr. Expt. Sta. B. 622, 40 p. June 1957. 100 P381
An exploratory study with the purpose of developing and testing methods of reducing retail distribution costs that can be applied usefully in small dairies with a minimum expenditure of resources. Techniques were established by which a small dealer could evaluate his delivery system and thus determine what phases of distribution could be improved. Includes time studies and volume analysis.

274. BABB, E. M. Use of economic-engineering techniques in reducing distribution costs for small market milk dealers. University Park, Pa., 1957. 168 p.
Thesis (Ph. D.) - Pennsylvania State University.
Abstract in Diss. Abs. 17(5):994. May 1957. 241.8 M58
A time study was made of 38 retail and mixed milk routes and efficiency of routemen.

275. BAUM, E. L., and PAULS, D. E. A comparative analysis of costs of farm collection of milk by can and tank in western Washington, 1952. Wash. Agr. Expt. Sta. Tech. B. 10,37 p.,illus. May 1953. 100 W27T

Costs were compared in terms of truck tank operation, investment in cans or tanks, refrigeration, time and amount of labor used, density and length of routes, daily volume of milk per shipper, and distance between shippers.

Includes 9 tables and 21 graphs and charts.

276. BEAL, G. M., and TWINING, C. R. Bulk handling of milk in the Washington, D. C., milkshed. Md. Agr. Expt. Sta. Misc. P. 176, 39 p. June 1953. 100 M36M

Presents the experiences of producers, handlers, and tank truck-owners during the first year of operation of the system. Information is given on hauling rates, laborers' attitudes, length and condition of farm lanes, type and capacity of tank truck used, and mileage in tank truck routes.

277. BEAL, G. M., and BAKKEN, H. H. Fluid milk marketing. Madison, Wis., Mimir Publishers, 1956. 556 p. 281.344 B36

Handling and transporting fluid milk, p. 147-186. This chapter deals with country assembly, rates, transportation from country receiving stations to city plants by railroad and by tank truck, costs of assembling and transporting from country plants compared with direct shipments, bulk hauling rates, and the influence of bulk handling on dealers' operations.

Wholesale and retail distribution, p. 481-535, covers delivery systems, types and lengths of routes, and functions performed by route drivers.

278. BOWRING, J. R. Tank-truck assembly of milk for New Hampshire. N. H. Agr. Expt. Sta. B. 410,24 p.,tables. Mar.1954. 100 N45

Advantages and disadvantages are discussed. Concludes that the greatest economies will accrue to dealers. Competition between dealers for milk from large producers will increase. Some additional payments for milk and handling appear to be a necessary incentive for the many small producers and truckers to buy the new equipment. Ten tables and three appendices are included.

279. BOWRING, J. R., and TAYLOR, K. A. Transition to the bulk assembly of milk in northern New England. N. H. Agr. Expt. Sta. B. 453,60 p. Ref. Oct.1958. 100 N45

Forty-four tables are included with the text.

The study relates plans, experiences, and attitudes of farmers using cans to those who had changed to bulk milk tanks. It discusses experiences and plans of milk dealers in bulk assembly, characteristics of truckers, transportation rates charged by mode of transport, possibilities of reducing costs and rates, and problems of transition to tank truck assembly.

280. BURRESS, T. Which farm pick-up tank and truck is best suited for your operation. Dairy Engin. Conf. Proc. 2:11-18. 1954. 44.9 D1482

Presents the most important factors to be considered in selecting a farm pickup tank for milk suited to a particular farm.

Also with title Factors to consider in making proper tanker selection for bulk milk pickup operation, (Excerpts) in South. Dairy Prod.

J. 62(1):22-23,33,76-78,80-81. July 1957. 44.8 So83

281. CHAPMAN, W. R. Controlled temperature of dairy products during delivery. Wash. State Col. Inst. Dairying. Proc. 25:25-35. 1956. 44.9 W27
Discusses dairy delivery trucks with relation to truck bodies, cold boxes, insulation, doors and bulkheads, and types of refrigeration.

282. CHELQUIST, G., and others. Experiences in cooperative marketing of dairy products: transportation. Midwest. Milk Mktg. Conf. Proc. 5:12-19. 1950. 280.3449 M583
J. W. Hartsock, E. Teal, and J. W. Winfrey, joint authors.
Presents the problems and experiences of cooperatives in contracting for the hauling of milk from producers to markets in the areas near Pittsburgh, Cleveland, Detroit, and Kansas City. Gives costs, rates, and number of trucks used.

283. CLARKE, D. A. Cost and pricing problems in wholesale milk delivery in the Los Angeles market. Berkeley, Calif., Agr. Expt. Sta., 1951. 29 p. 281.344 C1244
Contribution from the Giannini Foundation of Agricultural Economics.
The nature of delivery costs was explored, and the results summarized in terms of cost curves showing the tendency of average costs to decline with increases in volume per customer. This cost relationship has been used to emphasize the inadequacy and inequity of the existing system of flat pricing.
Detailed stopwatch records were made for each operation performed by the driver on each route during 2897 individual customer stops. Results are shown in tables and graphs.

284. CLARKE, D. A. Cost relationships for milk collection by can and by tank in California. Internatl. Assoc. Milk Control Agencies. Annu. Mtg. 16:134-139. 1952. 280.3449 N212
Summarizes the truck costs, container expense, and labor requirements for each method, indicates improved procedures in route operation, and points out how developments in the tank method may further reduce costs of milk distribution.

285. CLARKE, D. A. Milk delivery costs and volume pricing procedures in California. Calif. Agr. Expt. Sta. B. 757,77 p. Ref. Dec.1956. 100 C12S
One objective of the study was to determine the nature and effect of savings that might be made by the reorganization of milk deliveries. Studies were made of cost-volume relationships, truck-operating expenses, labor costs per stop, relations of costs and prices, time and labor requirements for alternate types of delivery services, both retail and wholesale. Appendix A gives instructions to timers for wholesale and for retail route studies.

286. CLEMENS, J. R. Refrigerated trucks for retail routes. Dairy Engin. Conf. Proc. 5:43-46. 1957. 44.9 D1482
Discusses the types of refrigeration used in retail milk delivery trucks, and experiments being made by one company with its 220 trucks.
Also in South. Dairy Prod. J. 62(3):51,54-55. Sept.1957. 44.8 So83
Also with title, The future for refrigerated trucks, in Milk Plant Mon. 46(7):21-23. July 1957. 44.8 C864

287. CONNER, M. C., and GILES, E. J. Milk delivery practices - alternatives and costs. Va. Agr. Expt. Sta. B. 515,59 p., tables. July 1960. 100 V81S
Evaluates in terms of work content and costs, several alternative arrangements for distributing milk products from the milk plant to retail and wholesale customers. Gives specific information on route characteristics including number of customers, miles per route, units per stop, daily load, time in hours, and labor and truck costs.

288. COOK, H. L., HALVORSON, H. W., and ROBINSON, R. W. Costs and efficiency of wholesale milk distribution in Milwaukee. Wis. Agr. Expt. Sta. Res. B. 196,40 p. Jan.1956. 100 W75
The study was made to measure the cost variation with volume per stop and variation due to kinds of service and types of container. The expenses of wholesale delivery result from labor requirements and truck expense.

289. COTTON, W. P. Milk hauling rates and problems in North Carolina. N. C. Agr. Expt. Sta. Dept. Agr. Econ. AE Inform. Ser. 28,62 p. Dec.1950. 281.9 N816
Characteristics of 364 milk collection routes were studied, including methods and frequency of assembly, ownership, type, age, and size of trucks, types of roads traveled, length of routes, number of patrons and volume per patron, hauling rates charged and interplant transportation charges. Conditions were appraised in terms of time required per hundred weight, extent of route duplications, and of unnecessary hauling. Rates and charges were appraised in relation to returns.

290. COWDEN, J. M. Bulk milk handling in 1955. U. S. Farmer Coop. Serv. Gen. Rpt. 22,38 p.,tables. Apr.1956. A280.29 F22G
Many tables supplement the text which depicts the extent and nature of the adoption of bulk methods of farm-to-plant transportation of milk as of March 1955. Data show ownership of bulk trucks and can trucks (by dairy, and contract haulers) by regions of the United States, trucks classified as to structural type and capacity, rates charged for bulk hauling and can hauling, size of plant, number of shippers, and route operating practices.

291. COWDEN, J. M. Comparing bulk and can milk hauling costs. U. S. Farmer Coop. Serv. FCS C. 14,13 p. June 1956. A280.29 F22F
Factors considered were truck operating costs, length of routes, investment in bulk tanks, large producers, and every-other-day service.

292. COWDEN, J. M. Farm-to-plant bulk and can milk hauling costs. U. S. Farmer Coop. Serv. Serv. Rpt. 18,56 p.,tables. Mar. 1956. A280.39 F22
Detailed analyses and comparisons of route operations indicated that larger payloads and less frequent pickup service associated with bulk operations resulted in reductions in time and mileage costs as compared to can hauling operations. Factors that affect comparative cost relationship are volume per patron, length of route, and route volume.

293. COWDEN, J. M. Farm-to-plant milk hauling practices of dairy cooperatives. U. S. Farm Credit Admin. B. 69,63 p. May 1952. 166.2 B87
Contains detailed discussion of milk routes, haulers, mileage

traveled by trucks per day, miles of route per patron, charges to patrons, methods of determining hauling rates, volume of milk hauled per mile, and various practices used by cooperatives to increase efficiency and reduce costs.

294. CROFTS, S. E. Recent developments in refrigerated transportation. Ice Cream Trade J. 53(10):94-95,130-131. Oct.1957. 389.8 Ic2
Lists and comments on some developments and trends. Larger-capacity bodies for wholesale deliveries, increased use of semi-trailers, lighter weight bodies, lighter weight refrigeration equipment, continuous over-the-road refrigeration equipment; walk-in types ice cream and frozen products bodies, pallet loading in wholesale bodies, use of conveyors in loading semitrailers, and combination two-temperature bodies are discussed.
Also in Ice Cream Field 70(4):136,138,140-142. Oct.1957. 389.8 Ic23

295. FISHER, A. C. Farm to plant tank trucking of milk. N. Y. State Assoc. Milk Sanit. Annu. Rpt. 25:121-124,126-127. 1951,pub. May 1952. 44.9 N4833
Experience of one company with its first tank pickup route. Includes description of procedure as carried out by farmer and driver, and discussion of advantages and disadvantages.

296. FISHER, A. C. A system of bulk milk cooling in farm tanks and tank transportation to market-developed for the Connecticut market. Noeast. Dairy Conf. Annu. Rpt. 17:63-73. 1952. 44.9 N818
Subjects discussed include size and type of tanks, method of cooling, problem of the small producer, sanitation, milk handling equipment, and the installation of bulk handling routes.

297. HAND, P. E., and PIERCE, C. W. Receiving and transportation costs for milk in the Philadelphia market,1954-55. Pa. Agr. Expt. Sta. Dept. Agr. Econ. & Rur. Sociol. A. E. & R. S. 6,21 p. Aug.1956. 281.9 P38
The relationship between transportation rates and distance is shown, and a table showing the comparison of actual transportation costs with 1956 rates is given. The object was to determine the fair Federal allowance for handling milk through country receiving stations and shipped to city plants.

298. HENDERSON, A. S., and COWAN, R. Bulk hauling, its cost problems - its savings. Milk Plant Mon. 45(5):18-19,41-42. May 1956. 44.8 C864
Tables show costs for can shippers and for bulk shippers, in Washington State.

299. THE IMPACT of bulk tank hauling upon costs of hauling milk and upon location adjustment provision in a Federal order (a panel discussion). Wash. State Col. Inst. Dairying. Proc. 25:63-74. 1956. 44.9 W27
I, From the viewpoint of administering a Federal order, by P. L. Buchanan; II, From the viewpoint of dairy farmers, by R. Cowan; III, From the viewpoint of the milk handlers, by A. S. Henderson; IV, A study at the State College of Washington, by M. V. Waananen.

300. INTERNATIONAL ASSOCIATION OF ICE CREAM MANUFACTURERS. Report of proceedings of the 49th annual convention, Boston, Mass., October 28-30, 1953. Washington, D. C., 1953. 4 v. 389.9 In83

Vol. I, General sessions, contains a panel moderated by C. S. Decker, p. 92-107. Speeches given were: An operator's viewpoint on truck leasing, by H. O. Matthews; Should we own them or lease them, by J. C. Gentile; Truck leasing, by J. J. Stedem.

301. ISHEE, S., and BARR, W. L. Effects of bulk milk assembly on hauling costs, farm to plant. Pa. Agr. Expt. Sta. B. 641,21 p., tables, charts. Dec.1958. 100 P381
Data were collected for daily can pickup, daily tank pickup, and alternate-day tank pickup. For similar volumes of milk, alternate-day tank collection costs for truck operation and labor were less, but required the same total fixed investment in equipment as daily tank collection. Costs were not greatly different on routes with small shipments per producer, on routes with large numbers of shippers, or on routes with considerable distance between shippers.

302. ISHEE, S. The impact of bulk milk handling on the market milk industry. University Park, Pa., 1957. 342 p.
Thesis - (Ph.D.) - Pennsylvania State University, 1957.
Abstract in Diss. Abs. 17(12):2862-2863. Dec.1957. 241.8 M58
Data were obtained from 127 farmers who had adopted bulk milk tanks, and the effects on costs of producing and hauling milk were analyzed. The average net new investment was $2,349 per farm. The average change in hauling rates was a reduction of eight cents per hundredweight after bulk milk assembly was adopted.

303. JENNINGS, H. Farm pick-up trucks. Milk Indus. Found. Conv. Proc. 51(Motor Vehicle Sect.):9-16. 1958. 44.9 In8
Type of vehicle for bulk milk collection is discussed in relation to size, capacity, mechanical aspects, and efficiency.

304. JENSEN, C. Cost of getting cream from the farm; direct rail shipment and truck pickup cheaper than cream station collection, study finds. N. Dak. Agr. Expt. Sta. Bimon. B. 15:83-84. Nov./Dec. 1952. 100 N813B

305. JOHNSON, S., and HENRY, W. F. Formulas for adjusting milk transportation rates. Conn. (Storrs) Agr. Expt. Sta. B. 274, 34 p. Mar.1951. 100 C76S
Presents a procedure for constructing the formula and an evaluation of this method, as well as a suggested formula for use in Connecticut.

306. JOHNSON, S. Load size and delivery labor cost in milk distribution. Conn. (Storrs) Agr. Expt. Sta. B. 264,20 p. Mar.1950. 100 C76S
Studied size of loads and routemen's earnings on wholesale and retail milk routes in the four largest cities of Connecticut.

307. JOHNSON, S., and HENRY, W. F. Using a formula to adjust milk hauling rates. Conn. Milk Prod. Assoc. C. M. P. A. B. 30(376): 2-3,6. Dec.1950. 44.9 C768
Gives specific illustrations of the cost items in hauling milk from farms to plants of Connecticut dealers. "This formula is not a panacea or a cure all. It is designed only to adjust rates for a trucker with a reasonably constant load."

308. KELLEY, P. L. Cost functions for bulk milk assembly in the Wichita market. Kans. Agr. Expt. Sta. Tech. B. 96,32 p.,map. May 1958. 100 K13S
Cost coefficients were provided from survey and engineering data for a 2 1/2 ton truck carrying a 1,700 gallon stainless steel tank. In addition, route labor and unloading time functions were computed from a time and motion study. Operating costs included depreciation, insurance, tires, gasoline, oil, lubrication, and transportation taxes.

309. KELLEY, P. L. Route organization and bulk milk assembly costs in the Wichita market. Kans. State Col. Agr. & Appl. Sci. Agr. Econ. Rpt. 82,22 p. July 1958. 281.9 K132
Provides detailed description of the structure of the assembly process, estimates cost variations among existing bulk routes, relates these costs to the hauling rate structure existing in the market, and suggests possible methods of reducing assembly costs in the market.
Tables show miles of travel, pounds of milk hauled, number of producers, travel time requirements, truck and tank costs, labor costs per mile and per 100 pounds, and average hauling rates.

310. KING, G. A., and BRESSLER, R. G. Efficiency of milk marketing in Connecticut. 12. Wholesale milk distribution. Conn. (Storrs) Agr. Expt. Sta. B. 273,56 p.,tables, charts. July 1950. 100 C76S
Time studies of particular route operations were analyzed. Equations express route time requirements as a function of such factors as miles traveled, route volume, and number of customers served. Studies of truck costs resulted in cost equations for trucks of the sizes and types commonly used in wholesale milk delivery.

311. KLEIN, J. E. Costs of distributing milk through vending machines and by retail and wholesale routes, Martinsburg, W. Va. U. S. D. A. Mktg. Res. Rpt. 229,42 p. Ref. May 1958. 1 Ag84Mr
Route organization, labor utilization, and operating costs were studied. The higher cost of vending was attributed to the high unit costs of the vending machine and to the location rental.

312. LUHMAN, G. B. Plastic materials for truck body, bulk tank, and tankers. Dairy Engin. Conf. Proc. 5:58-63. 1957. 44.9 D1482
Reports on findings of experiments by the Heil Company of Milwaukee with the use of plastics for bulk milk tankers and trailers. Weight reduction, insulation, and elimination of rust and corrosion are the chief advantages discussed.
Also in South. Dairy Prod. J. 63(2):30,32,34,37-38,40,42-43. Feb. 1958. 44.8 So83

313. MCKINNEY, K., and STELLY, R. Farm-to-plant hauling and receiving bulk milk. Tex. Agr. Expt. Sta. MP-377,11 p. Oct. 1959. 100 T31M
Deals with the differences in assembling and receiving milk in bulk and cans in Texas. Differences in cost of equipment and investments, changes in routes and route control, relative densities of routes and hauling rates, variations in weight of milk between the farm and the plant and methods of measuring, and problems of converting to bulk assembly are considered.

314. MARZKE, F. O. Resistance of drums and barrels containing nonfat dry milk to insect invasion. U. S. D. A. Mktg. Res. Rpt. 307, 9 p. Mar.1959. 1 Ag84Mr
Concludes that the standard method of packing in drums containing a kraft sealer, a kraft outer liner, and a polyethylene inner liner presents a container highly resistant to invasion by the larger cabinet beetle and the black carpet beetle during storage.

315. MIDWESTERN MILK MARKETING CONFERENCE. Proceedings, 5, 8, 11. 1950, 1953, 1956. 3 v. 280.3449 M583
Fifth, held at Ohio State University, Columbus, in March 1950 contains text of a panel on Experiences in cooperative marketing of dairy products: Transportation, p. 12-20, by G. Chelquist, J. W. Hartsock, E. Teal, and J. W. Winfrey.
Eighth, held at Iowa State College, Ames, in April 1953, contains a paper, Bulk farm tanks, by O. Owens, p. 12-16.
Eleventh, held at the University of Illinois, Urbana, in April 1956, contains the following papers on bulk tanks: Is a bulk tank practical in a small market, by J. D. York, p. 12-14; Is 100 percent conversion to bulk tanks practical, by W. J. Grant, p. 15-18; Can I afford to purchase a bulk tank, by C. E. French, p. 19-24; Financing, guaranteeing and servicing bulk tanks in the Chicago milkshed, by J. H. Argue, p. 25-28; Financing and servicing bulk tanks, by G. N. Pederson, p. 29-34; Financing the bulk tank operation, by A. Miller, p. 35-37; and Resume of discussion of bulk tanks in place of milk cans, by E. Baumer, p. 38.

316. MILK INDUSTRY FOUNDATION. Convention proceedings, 51st annual convention, Chicago, Ill., December 8-10, 1958; motor vehicle section, n. p. 1958. 48 p. 44.9 In8
Issued annually.
Each issue contains papers which deal with such subjects as operation and maintenance of bulk trucks, selection of vehicles, truck design, insulation of truck bodies and tanks, leasing versus owning of trucks, refrigeration and icing, selection of vehicles, recordkeeping, cost control, dairy trucking survey, and economics.

317. MILLER, A. H. Bulk handling of Wisconsin milk - farm to plant. Wis. Agr. Expt. Sta. Res. B. 192,72 p. Feb.1956. 100 W75
Advantages, disadvantages, and economics are considered. Concludes that bulk handling can be expected to increase the cost of handling milk on most Wisconsin farms, but larger producers can cut hauling costs by alternate day hauling. Hauling rates are discussed on p. 47-56.

318. MYRICK, N. Leasing trucks. Amer. Milk Rev. 16(6):78,80, 82-83. June 1954. 44.8 Am38
Advantages and disadvantages of leasing trucks for retail delivery by milk plants.
Says the basic decision depends on whether or not capital invested in trucks could be used to better advantage in other areas of the business.

319. NATIONAL CONFERENCE ON BULK MILK HANDLING. Bulk milk handling; papers presented, Michigan State University, May 13-14, 1957. Compiled by C. W. Hall, and D. L. Murray. Lansing, Mich. Agr. Expt. Sta., 1957. 132 p. 280.3449 N213
Contains twenty papers by different authors dealing with such subjects as tanker selection, regulation of haulers, contract hauling

versus use of company vehicles, methods of financing, daily versus every-other-day pickup, and economic aspects.

320. PADGETT, J. H. Marketing milk by the bulk tank method. Ga. Agr. Expt. Sta. C. (n.s.) 5,25 p. June 1956. 100 G293Ci
Findings concerning attitudes of producers and comparisons of costs are included.
Objectives of this study were to determine: 1, The status of bulk handling in Georgia; 2, the capital outlay required for converting to bulk handling; 3, the comparative costs of handling milk in bulk and in cans; and 4, the size of operation that could economically be changed to bulk handling.

321. PATTERSON, G. Unitized product handling, new type truck and truck loading method show way to cut distribution costs. Ice Cream Rev. 41(3):50-52,84,illus. Oct.1957. 389.8 Ic22
In Naussau County, New York, a company worked out a system for loading route trucks with ice cream by abolishing conveyors, palletizing the storage area, and using wing-type pallets and straddle-type forklifts.

322. PERRY, R. L. Tank truck collection of milk from farms. Agr. Engin. 32(9):478-480. Sept.1951. 58.8 Ag83
Lists the principal advantages of the farm bulk truck collection system for the patron, the processor, the driver, and the public. Contains an 18-point routine for the truckdriver, and a table of unit costs of milk collection in cans and by farm tank system.

323. ROBINSON, R. W. Costs and efficiency of wholesale milk distribution in Milwaukee with particular reference to problems of wholesale pricing. Madison, Wis., 1957. 196 p.
Thesis - (Ph. D.) - University of Wisconsin.
Abstract in Diss. Abs. 17(11):2358-2359. Nov.1957. 241.8 M58
Routes from five milk firms were studied. Labor operations were timed with stopwatches. Average cost per stop in 1954 was $1.128 of which $0.934 was labor cost and $0.294 was truck expense. No conclusive answer was reached concerning cost variation associated with different sizes and types of containers.

324. ROOF, J. B. Milk receiving costs during shift from can to bulk. U. S. Farmer Coop. Serv. Gen. Rpt. 77,27 p.,illus.,tables, charts. July 1960. A280.29 F22G
Studied the operations of 10 midwestern milk assembling and shipping plants, some of which received milk in cans only, some in bulk only, and some in both. Bulk plants experienced lower total unit costs than either can or dual plants at comparable volumes. Table 1 shows time requirements in minutes for various operations, as well as number of vehicles unloaded.

325. SCHNEIDER, E. Diversion of butter traffic from rail to truck. U. S. Bur. Agr. Econ. Mktg. & Transportation Situation MTS-86:6-13. July 1950. 1.941 M8M34
Table 5 shows the estimated reduction in rail revenues due to diversion of butter from railroads to trucks, by principal origins.

326. SINCLAIR, R. O. Economic effect of bulk milk handling in Vermont. Vt. Agr. Expt. Sta. B. 581,35 p. June 1955. 100 V59
Presents the advantages and disadvantages, costs and savings. "Bulk handling of milk can be a blessing to the small dairyman or it

can be just another millstone hung around his neck, gradually drawing him out of the production picture."

327. STOCKER, N. Progress in farm-to-plant bulk milk handling. U. S. D. A. Farmer Coop. Serv. C. 8,53 p.,illus. Nov.1954. A280.29 F22F

The text is supplemented with 26 tables and several illustrations. This report measures and describes the extent, location, and variable patterns of industry progress and trends in adopting the bulk handling system in all States other than California and Florida. It includes information on ownership and operation of hauling facilities, type and capacity of tanker transports, tank milk collection schedules, and hauling rates and differentials.

328. THOM, E. Tank truck pick-up of farm tank bulk milk. Butter, Cheese & Milk Prod. J. 43(2):26-28,44,46-48. Feb.1952. 286.85 B98Bu

Certain large dairy farms are cited as examples of those who use the bulk tank. Pickup schedules, costs of operation, tank truck sizes, sanitation, and four distinct types of tanks are discussed.

Also in Milk Dealer 41(4):38-39,100-107. Jan.1952. 44.8 M595

329. THOMPSON, W. J. Refrigerated wholesale and retail trucks for dairy plants. Dairy Engin. Conf. Proc. 3:43-49. 1955. 44.9 D1482

Describes types of truck bodies, refrigeration, and type of insulation. Based on experience of the Carnation Company in Los Angeles.

Similar material with title, Refrigerated trucks, appeared in Wash. State Col. Inst. Dairying Proc. 23:113-118. Mar.1954. 44.9 W27

330. THOMPSON, W. J. Truck refrigeration for dairy products. Milk Dealer 47(8):142-146. May 1958. 44.8 M595

Text of a paper presented at the 47th Annual Dairy Industries Conference, Corvallis, Oreg., February 1958.

Gives cost of refrigerated trucks and trailers, types of refrigeration, cost of operation, selection of truck equipment, type of body, and type of insulation.

Also in Ice Cream Rev. 42(1):73-76. Aug.1958. 389.9 Ic22

331. U. S. AGRICULTURAL MARKETING SERV. Regulations affecting the movement and merchandising of milk; a study of the impact of sanitary requirements, Federal orders, State milk control laws, and truck laws on price, supply, and consumption. U. S. D. A. Mktg. Res. Rpt. 98,124 p. June 1955. 1 Ag84Mr

Sections of interest on p. 81-87 are: Transportation regulations; Highway load limitations; and Vehicle license fees and taxes.

332. WAANANEN, M. V., and BARTLETT, R. W. Impact of bulk handling of milk. Wash. Agr. Expt. Sta. B. 607,34 p.,map. Ref. Oct. 1959. 100 W27E

Analyzed costs of hauling milk in cans compared with bulk tanks, effect of bulk hauling on supply areas, on seasonality of milk production, and on the volume of milk production per producer. Includes an appendix showing transportation cost analyses for individual markets.

333. WAANANEN, M. V. Methods of determining farm bulk milk hauling rates. Wash. State Col. Inst. Dairying. Proc. 27:89-93. 1958. 44.9 W27

Gives a specific example showing how to calculate costs for one day on a given milk route. Time requirements in minutes are shown for unloading, waiting, washing, pickup and other items. Calculations of costs for labor, depreciation, repairs and upkeep on truck, and division of costs into fixed, mileage, and volume costs are given.

Also in Dairy Foods Rev. 62(8):16-17. Aug.1958. 286.85 P11

334. WAANANEN, M. V., and WYCKOFF, J. B. Suggested methods of establishing farm bulk milk hauling rates. Wash. Agr. Expt. Sta. B. 603,21 p. Apr.1959. 100 W27E

The elements that constitute average daily hauling costs are itemized, three methods of distributing the cost among individual shippers and three methods of calculating rates are explained and illustrated.

335. WELDEN, W. C. The small producer and bulk. Milk Plant Mon. 46(3):18-20,22. Mar.1957. 44.8 C864

Appraises New England experiences with bulk milk handling and debates charge that the bulk tank works hardship or penalty on small producers. Estimates tank costs, hauling premiums, increased income, and minimum cost of the bulk operation.

336. WILCOX, E. C. Transportation of Wisconsin milk from farm to market. Wis. Dept. Agr. B. 308,74 p. July/Aug.1951. 2 W752Bu

Contents: Pt. 1, Wisconsin's dairy industry; Pt. 2, The public highway system; Pt. 3, The hauling of Wisconsin's milk; Pt. 4, Hauling charges and costs; Pt. 5, Other dairy products move by truck.

Data are presented in 71 tables and 41 charts. Includes information on distances driven, types of roads, length of routes, and contract hauling.

Fruit

General

337. ANDREWS, B. G., and BURT, S. W. Methods, equipment, and facilities for receiving ripening, and packing bananas. U. S. D. A. Mktg. Res. Rpt. 92,127 p.,illus.,tables. June 1955. 1 Ag84Mr

Methods, labor, costs, and equipment used by wholesale distributors for receiving bananas from railroad cars or motortrucks to ripening rooms are considered on p. 13-47. Man-hours of labor required for various operations are shown in tables.

338. ASSOCIATION OF AMERICAN RAILROADS. REFRIGERATOR CAR RESEARCH. A. A. R. Test no. 45. Prunes - Milton-Freewater, Oregon to Chicago, Ill., testing three refrigerator cars - using standard refrigeration, two percent salt and forced air circulation, using three different types of fans August-September 1951. A. A. R. Test no. 46. Oranges - Kathryn, California to Jersey City, New Jersey, testing four refrigerator cars - using refrigerator rule 245, or preiced cars retouched and re-iced twice in transit and forced air circulation, using four different types of fans, September 1951. Final report. Chicago, Oct. 1951. 53 p.,illus.,tables,charts. Bur. Railway Econ. Libr.

339. BARGER, W. R. Performance test with overhead fan cars. Grapes from Delano, Calif. to New York City, October 1949. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 231, 10 p., tables, charts. May 1950. 1.9 P772Ht
Compares transit temperatures in three sample cars to find most efficient type of fan, its location in the car for best circulation of air and most uniform cooling.

340. BARGER, W. R. Refrigerated strawberry cases. Mod. Packaging 24(3):125-126, 173, 175. Nov. 1950. 309.8 M72
Fiberboard containers for strawberries were shipped with dry ice in planes without refrigerated compartments. The cost, dimensions, and approximate weight of the fiberboard trays and shipping case are given in Table 1.

341. BARR, E. L. Problems of the grape shipper. Conf. Transportation Perishables. Proc. 1953:51-54. 280.39 C765
Deals with rates, services, claims, and trucks.

342. CALIFORNIA FRUIT EXCHANGE. Annual report, 1959. Sacramento, 1960. 18 p. 81 C1272
Issued annually.
Includes figures showing tonnage shipments by the California Fruit Exchange of pears, grapes, cherries, apricots, peaches, nectarines, and plums. Comments briefly on traffic and motor transportation.

343. FOUNTAIN, J. B., and STOKES, D. R. Evaluation of shipping containers for Florida avocados. U. S. D. A. Mktg. Res. Rpt. 228, 24 p. May 1958. 1 Ag84Mr
Describes containers of fiberboard and wood, of various sizes and shapes, and the arrival condition of the avocados and the containers in terminal markets. Shows costs of containers, packing materials, and labor and makes recommendations regarding packing to minimize bruising and discoloration in transit.

344. FOUNTAIN, J. B., and CHAPOGAS, P. G. Evaluation of shipping containers for Washington cherries. U. S. D. A. Mktg. Res. Rpt. 426, 26 p. Sept. 1960. 1 Ag84Mr

345. FOUNTAIN, J. B. Shipping containers for cherries and apricots. U. S. Agr. Mktg. Serv. Agr. Mktg. 3(5):6. May 1958. A280.38 Ag8
Time and labor costs for packing into shipping containers are given, with comments on different sizes.

346. GASTON, H. P. Handling fruit in bulk boxes. N. Y. State Hort. Soc. Proc. 102:81-83. 1957. 81 N484
Advantages to the grower, the trucker, and the processor, when 20 or more crates of fruit can be handled as a unit.

347. GASTON, H. P., and LEVIN, J. H. Transporting red cherries in water from orchard to processing plant. Mich. Agr. Expt. Sta. Q. B. 37(3):437-443. Feb. 1955. 100 M58S
The tank truck transport method maintained fruit quality, improved grade, reduced handling costs, simplified management, maintenance, distribution, and accounting problems, eliminated lugs and lug storage, and was commercially feasible.

348. GASTON, H. P., and LEVIN, J. H. Ventilated picking lugs for strawberries to be processed. Mich. Agr. Expt. Sta. Q. B. 39(4): 546-556. May 1957. 100 M58S

A new "V-lug" container designed for both picking and transportation of berries was compared with the carrier-conventional-lug method as to costs, handling, loading, and maintenance of quality of fruit, and was found to be superior.

349. GERHARDT, F., SCHOMER, H., and WRIGHT, T. R. Sealed film lug liners for packing Bing cherries. U. S. Agr. Mktg. Serv. AMS-121, 8 p. Sept.1956. A280.39 M34Am

Perforation of the films were required at certain temperatures, but decay was markedly reduced, and stem freshness and fruit brightness were preserved by use of sealed film box liners. Fifteen carloads of cherries were shipped and marketed successfully in poly lug liners in 1955.

350. GERHARDT, F. Use of film box liners to extend storage life of pears and apples. U. S. D. A. C. 965,28 p. Apr.1955. 1 Ag84C

Film was used in both cartons and wooden boxes as a liner and sealed. Atmosphere and decay in sealed packs are considered as are ripening capacity and dessert quality, and film perforation requirements.

351. GILBERT, F. A. New strawberry crate for 1950. N. J. State Hort. Soc. Hort. News 31:2271,2280. May 1950. 81 N46

Describes and lists advantages of the new 16-quart wirebound strawberry crate.

352. GUILLOU, R. Current developments in fruit packages related to refrigeration and transportation. Conf. Transportation Perishables. Proc. 1956:34-39. 280.39 C765

Includes a table showing approximate cooling times for various containers and packages of different sizes, stacked with four sides exposed, with top and bottom vents, with no vents, with lidded lugs or open lugs, in loads shipped by rail and by truck.

353. HALE, P. W., and STOKES, D. R. Prepackaging California grapes at shipping point. U. S. D. A. Mktg. Res. Rpt. 410,35 p.,illus., tables. July 1960. 1 Ag84Mr

Includes master containers, with labor requirements for packing into wood shipping containers, into fiberboard shipping containers and into conventional wooden boxes. Transportation charges are shown per shipping container and per carload.

354. HRUSCHKA, H. W., and others. Effects of precooling, salting, carton ventilation, and load pattern on temperature, moisture condensation and spoilage in rail shipments of prepackaged early black Massachusetts grown cranberries. U. S. Agr. Mktg. Serv. AMS-43,23 p. Mar.1955. A280.39 M34Am

J. Kaufman, W. H. Redit, G. B. Ramsey, and E. M. Harvey, joint authors.

The primary objective was to eliminate moisture condensation on the outer and inner surfaces of the cellophane bags and the master carton in order to avoid spoilage and decay.

355. KAUFMAN, J., and others. Effect of precooling on market quality of cranberries shipped by rail or truck. U. S. D. A. Mktg. Res. Rpt. 287,9 p. Dec.1958. 1 Ag84Mr
S. M. Ringel, A. A. Hamer, E. P. Atrops, and G. B. Ramsey, joint authors.
Shipping tests were made with two pairs of cars and in one pair of trucks to compare the effects of precooling and of nonprecooling on transit temperatures, decay, and keeping quality. Freshly harvested, precooled cranberries developed less decay in transit than nonprecooled berries, but after three or four weeks of storage, there was little difference.

356. KAUFMAN, J., BENFIELD, P. L., and HARDING, P. R. Shipping tests with Massachusetts-grown cranberries in conventional refrigerator cars with standard ventilation and in mechanically refrigerated cars, 1955. U. S. Agr. Mktg. Serv. AMS-187,9 p. 1956? A280.39 M34Am
When shipped in mechanically refrigerated cars during warm weather, the berries cooled fairly rapidly in transit. When shipped in cool weather in standard ventilated cars containing cartons and wirebound crates as master containers, the temperatures in the middle layer were higher than desirable. The wirebound crates were five degrees cooler than the cartons.

357. LEVIN, J. H., and GASTON, H. P. Fruit handling with forklift trucks. Mich. Agr. Expt. Sta. Spec. B. 379,25 p. June 1952. 100 M58S
Advantages to growers, packers and processors are discussed. Tables show time and labor cost figures for various handling operations with cherries and apples, and costs of purchasing and operating the truck. There were savings in time, labor, money, in crate and lug breakage, and from improved quality of fruit.

358. LEVIN, J. H., and GASTON, H. P. Grower handling of red cherries. U. S. D. A. C. 981,20 p. May 1956. 1 Ag84C
Describes a method of handling cherries in lugs with forklift trucks, which saves time, labor, and money, and reduces bruising and spillage and reduces congestion and lug breakage. Another more advantageous method was developed by which cherries are handled in water. It was found to help maintain quality of fruit, improve grade by orchard sorting, reduce cost of handling, eliminate lugs and lug storage and accounting, and simplify management.

359. LEVIN, J. H., and GASTON, H. P. Hydracooling and transporting red cherries in water; a progress report. Mich. Agr. Expt. Sta. Q. B. 36(4):378-385. May 1954. 100 M58S
An experiment using a tank truck showed that the cherries lost less weight in transit, showed less scald, required less sorting, could be unloaded more rapidly with less labor than those hauled in lugs. The use of tank trucks will effect considerable savings in the total number of lugs required.

360. LEVIN, J. H., and HANSEN, C. M. Multiple purpose tanks for Michigan cherry growers. Mich. Agr. Expt. Sta. Q. B. 40(4):955-959. May 1958. 100 M58S
An experimental tank, treated inside with a rust-resistant coating, was mounted on a trailer and used in applying liquid fertilizer, cleaned, and used for transporting cherries in water.

361. MANN, G. The carriage of bananas in refrigerated ships. Mod. Refrig. 61(718):40-43,illus. Jan.1958. 295.8 M72
The effect of wrapping on the rate of cooling. Data obtained in test runs made at Ditton Laboratory of the British Department of Scientific and Industrial Research. In each experiment the temperature was approximately that met with in practice, but the velocity of air was varied over a wide range.

362. O'BRIEN, M. Designs for bulk fruit bins. Calif. Agr. Expt. Sta. C. 490,12 p.,illus. Sept.1960. 100 C12S
Plans include sizes, shapes, costs, materials of construction, weight, net volume, pallet bottoms, handling and stacking.

363. PANEL on cost of transportation. Fla. Mango Forum. Proc. 12:28-33. 1952. 93.09 F66
Leader: V. Gallagher; panel members: T. Hiott, R. Holland, H. Saunders, V. Gallagher, and W. W. Carmichael.
Discusses rates on lugs of mangoes from Florida to the New York area by airlines, trucks, and American Express, and also the need for high quality graded fruit, and a standard type of packing container.

364. PENTZER, W. T., BARGER, W. R., and KAUFMAN, J. Tests on the shattering of grapes in transit in shipments made from California to New York, in August, September and November, 1948. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 207, 9 p.,tables. Feb.1949. 1.9 P772Ht
This is a progress report based on a limited number of cars. Factors involved in shattering included loading method, car construction, position in the train, and kind of care the car received in transit. A tight load and brace appeared to be the best protection. Padding the bulkhead was no solution.

365. PFLUG, I. J. Unloading soft-fleshed fruit from bulk boxes. Mich. Agr. Expt. Sta. Q. B. 43(1):132-141,illus. Aug.1960. 100 M58S
A water submergence bulk box unloading machine tested with apples is described and illustrated. It was a more gentle method and prevented many bruises and skin cuts or punctures.

366. PILZ, E. J., BARRY, G., and STOKES, D. R. New shipping containers for plums. U. S. D. A. Mktg. Res. Rpt. 128,44 p.,illus. June 1956. 1 Ag84Mr
Describes the development, and evaluates the performance of new fiberboard containers designed to pack 25 pounds of plums. Considers the costs of containers, methods of loading, arrival condition of plums, and advantages and disadvantages of individual containers.
The development and evaluation was undertaken by the California Grape & Tree Fruit League under U. S. Department of Agriculture contracts.

367. PILZ, E. J. Plum container studies. Conf. Transportation Perishables. Proc. 1954:152-156. 280.39 C765
Observes that the "ride" given the fruit in corrugated containers is much less severe under like conditions than that in the four-basket crate, even though each layer of fruit is separate in the crate.

368. REDIT, W. H., and others. Comparison of floor type with overhead electric type refrigerator car fans in the precooling and transit refrigeration of California table grapes, September 1952.

U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 288, 5 p., tables, figures. Feb. 1953. 1.9 P772Ht
A. L. Ryall, D. B. Hannum, and H. W. Hruschka, joint authors.
There was little difference in either rate of precooling or in transit temperature in cars equipped with the regular Preco floor type fan and those with the new Preco overhead electric fans.

369. REDIT, W. H., and HAMER, A. A. Precooling and shipping Louisiana strawberries. U. S. D. A. Mktg. Res. Rpt. 358, 39 p. 1959. 1 Ag84Mr
Shipping tests by rail and by truck were made to study methods of precooling and shipping berries, experimental fiberboard containers, the performance of fans in the car before shipment, how improved express cars can refrigerate strawberries in transit, and the amount of precooling in vehicles that is necessary before shipment begins.

370. REDIT, W. H., and HARDENBURG, R. E. Refrigerator car heater test with bananas, New Orleans to Winnipeg, January 1952. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 264, 10 p., tables, charts. May 1952. 1.9 P772Ht
Compared the underslung charcoal heater with thermostatically controlled alcohol heaters, the effects of open and plugged bunker drains, and the use of fan cars and nonfan cars in maintaining desired fruit temperatures during transit.

371. REDIT, W. H., and HEINZE, P. H. Transportation test of heaters in refrigerator cars with bananas, New Orleans to Winnipeg, January 1951. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 241, 11 p., tables, charts. Apr. 1951. 1.9 P772Ht
Studied the performance of thermostatically controlled alcohol heaters in both fan and nonfan cars, and performance of the underslung heater, in addition to the effect of open drains and self-sealing type drains on heater operation and fruit temperatures near the drains.

372. REDIT, W. H., and COOK, T. H. Transportation test of underslung charcoal heaters in fan cars with bananas, New Orleans to Winnipeg, February 1950. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 226, 26 p., tables, charts. June 5, 1950. 1.9 P772Ht
Manually controlled underslung heaters maintained uniform temperature of fruit. They were easier to service and to inspect than portable heaters in the bunkers, but fuel consumption was greater.

373. RICHARDSON, H. B. Car precooling of table grapes. Conf. Transportation Perishables. Proc. 1958:70-76. 280.39 C765
Based on studies in the Coachella Valley of California with Thompson Seedless and Tokay grapes. It was found that railroad cars of table grapes should be precooled before shipping to a uniform load temperature of 40° F. throughout, and that cooling should be done quickly.

374. RICHARDSON, H. B. 28 lb. cartons for California Emperor grapes. Blue Anchor 35(2):12-13, 42. May 1958. 286.83 B62
Report on shipping trials with fiberboard telescope containers holding 28 pounds of loose grapes, with no pad liners or top protectors, in a channel type load. Both fruit and containers came through in very good condition.

375. RYALL, A. L. The effects of bunker salting, dry ice, and air circulation on temperatures in express shipments of fresh strawberries. Conf. Transportation Perishables Proc. 1956:73-85, charts. 280.39 C765

The factors that affected temperatures in the cars from California to Chicago and New York were interrelated. Seasonal weather conditions varied sufficiently to require bunker salting and the use of dry ice to be adjusted to seasonal needs.

Also reprinted by U. S. Agricultural Marketing Service.

376. RYGG, G. L. Influence of handling procedures and storage and transit temperatures on improving and maintaining quality of dates. Date Growers' Inst. Rpt. 35:2-5. Ref. 1958. 81 D26

Includes some discussion of transit temperatures and cooling methods.

377. SAMMET, L. L. Efficiency in fruit marketing; orchard-to-plant transportation. Giannini Found. Agr. Econ. Mimeog. Rpt. 131, 29 p. July 1952. 281.9 G34M

California Agricultural Experiment Station and the U. S. Bureau of Agricultural Economics, cooperating.

Different methods of loading, transferring and unloading and types of equipment were compared to discover the relative labor and equipment requirements of each. Studies were made in pear, apple, and peach orchards. The major methods and equipment investigated were: (1) Highway trailer; (2) truck; (3) forklift attachment; (4) truck and orchard trailer; (5) truck and forklift attachment.

378. SCHOMER, H. A., GERHARDT, F., and SAINSBURY, G. F. Polyethylene box liners for pears and apples. Wash. State Hort. Assoc. Proc. 50:193-198. 1954. 81 W273

Strength and toughness, resistance to moisture, stability during storage, and permeability to carbon dioxide and oxygen at 30° F. were essential qualities possessed by the film. Studies of its commercial use, effect of liners on fruit, and rate of cooling in film liners were made.

379. SHADBURNE, R. A. Improved loading of baskets of peaches and fresh prunes in railroad cars; a study of damage and cost reduction. U. S. D. A. Mktg. Res. Rpt. 275, 76 p., illus. Sept. 1958. 1 Ag84Mr

Tests showed that basket damage in rail shipments can be reduced more than 50 percent and important economies achieved in transportation and refrigeration costs by using the alternately inverted crosswise offset method of loading, instead of the conventional upright method.

380. SOMMER, N. F. Transit injury to fresh fruits. Conf. Transportation Perishables. Proc. 1958:76-81. 280.39 C765

Simulated transit testers used with apples, plums, pears, apricots, and berries found that fruit must be held tightly in place during rail transit if attractive appearance is to be retained. Pads will hold fruit in place in cartons if padding is compressed with tightly held lids. Corrugated paper cartons have considerable cushioning ability.

381. STRAWBERRY clinic; a symposium. Conf. Transportation Perishables. Proc. 1956:149-160. 280.39 C765

Includes summary of a paper by A. L. Ryall on Precooling and transit temperatures of strawberries.

382. WRIGHT, T. R., and ADAMS, D. F. Salting practices in express fan cars loaded with Pacific Northwest cherries. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 215,5 p.,tables, charts. Aug.1949. 1.9 P772Ht

Standard refrigeration with three percent salt applications or less did not give desired refrigeration to loads of warm or only slightly cooled sweet cherries. Elimination of customary precooling and dependence on cooling by fan cars in transit was not feasible with the amount of salt used in this test.

Apples

383. CARLSEN, E. W., and others. Innovations in apple handling methods and equipment. U. S. D. A. Mktg. Res. Rpt. 68,89 p.,illus., tables. Jan.1955. 1 Ag84Mr

R. S. Duerden, D. L. Hunter, and J. E. Herrick, joint authors.

One of the tests involved the loading of apples into refrigerator cars and unloading at destination, using a pallet system. Use of this system proved to be more than twice as expensive as the commonly used methods. Also includes a section on unloading from road trucks.

384. CARLSEN, E. W., HUNTER, D. L., and DUERDEN, R. S. Methods and costs of loading apples in the orchard in the Pacific Northwest. U. S. D. A. Mktg. Res. Rpt. 55,25 p. Jan.1954. 1 Ag84Mr

Discusses common and improved methods of loading orchard trailers and special trailers designed for pallets, as well as the loading of road trucks at the orchard. Compares methods of loading directly from trailers, with and without roller conveyors, transferring manually from trailer to ground stack or to platform and then to truck by handtruck. Also compares unloading methods at warehouse from trucks using conventional pallet system and trucks using dunnage strips and stevedore-type trucks.

385. GASTON, H. P., and LEVIN, J. H. Handling apples in bulk boxes. Mich. Agr. Expt. Sta. Spec. B. 409,20 p. Apr.1956. 100 M58S

Considers uses, characteristics, and advantages of bulk boxes to growers, processors, and truckers.

386. HARDENBURG, R. E. Polyethylene film box liners reduce weight loss and prevent shriveling of eastern-grown Golden Delicious apples, 1953-54 season. U. S. Agr. Mktg. Serv. H. T. & S. Off. Rpt. 315,14 p. Aug.1954. 1.9 P772Ht

Because of the improved keeping quality, the added cost of using film liners would be justified for apples intended for late storage. Check boxes with regular paperboard liners were unsalable after six months in storage.

387. HERRICK, J. F., MCBIRNEY, S. W., and CARLSEN, E. W. Handling and storage of apples in pallet boxes; an interim report. U. S. Agr. Mktg. Serv. AMS-236,41 p.,illus. Apr.1958. A280.39 M34Am

The pallet boxes studied included variation in design, materials, and dimensions. Cooling rates were evaluated, bruising characteristics were observed, structural features were considered, and labor and equipment costs were determined. Apples in pallet boxes had fewer bruises than apples in standard field boxes, and corrugated fiberboard liners reduced bruising still more. Savings were realized by the use of pallet boxes.

Summarized by G. Patchen with title, Cooling of apples in bulk bins, in Wash. State Hort. Soc. Proc. 54:61-62. 1958. 81 W273

388. HERRICK, J. F. Research development in the use of pallet boxes for handling and storing produce. U. S. Agr. Mktg. Serv. AMS-388:181-185. July 1960. A280.39 M34Am
Paper presented at the National Marketing Service Workshop at West Lafayette, Ind., November 17-19, 1959. Deals with shipping containers for apples.

389. LEVIN, J. H., and GASTON, H. P. A bulk box dumper for handling fruit. Mich. Agr. Expt. Sta. Q. B. 39(4):557-562. May 1957. 100 M58S
Describes the operation of the machine in handling apples for several months, and points out its advantages. It caused less bruising of fruit than the emptying of field crates by hand.

390. MCBIRNEY, S. W., and VAN DOREN, A. Pallet bins for harvesting and handling apples. Wash. Agr. Expt. Sta. Sta. C. 355, 11 p. Apr.1959. 100 W27S
The use of pallet bins instead of standard boxes as shipping containers cut the costs in terms of man-hours. Bruising of fruit in bins and boxes was compared. Desirable sizes and designs of bins are recommended. Tables show time used in loading and hauling bins on highway truck, loading boxes onto pallets on highway truck, hauling empty boxes from plant to orchard, and hauling bins with straddle carrier.

391. POWELL, J. V. Appalachian apples—packing costs and efficiency. U. S. D. A. Mktg. Res. Rpt. 435,20 p. Oct.1960. 1 Ag84Mr

392. REDIT, W. H., and WRIGHT, T. R. Heater test with apples - Wenatchee, Washington to Chicago, Illinois - February 1949. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 208,8 p., tables,charts. Apr.1949. 1.9 P772Ht
The test included thermostatically controlled alcohol and charcoal heaters and noncontrolled charcoal heaters in fan cars, standard charcoal heaters in a nonfan car, underslung charcoal heaters and a mechanical unit. In general, the fan cars showed a more uniform commodity temperature than the two nonfan cars with a smaller temperature spread between top and bottom fruit.

393. SHADBURNE, R. A. Loading methods for truck shipments of apples in fiberboard boxes. U. S. Agr. Mktg. Serv. AMS-321,27 p. July 1959. A280.39 M34Am
Uniformity of sizes of boxes helped to reduce container damage. Load patterns in which all the boxes in succeeding stacks of the loads were in the identical positions as those in the first stack provided air channels and more effective refrigeration during transit.

394. SMITH, E., and WRIGHT, T. R. Bruising of Pacific Northwest apples during shipment and distribution to retail stores in Texas. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 256, 7 p.,tables. June 1951. 1.9 P772Ht
Tests were made to get information on: (1) The relation of heavy and light packs in wooden boxes and fiberboard cartons to apple bruising: (2) prevention of bruises by careful handling of wooden boxes in carloading, unloading, and market distribution; (3) the relation of

loading tray-pack cartons lengthwise as against crosswise in refrigerator cars; and (4) the bruising of apples in bulk-filled cartons. Also in Appleland News 15(12):16-24. Dec.1951. 80 Ap53

395. SMITH, E., and others. Bruising of Pacific Northwest apples during shipment and market distribution. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 229,9 p.,illus.,tables. June 1950. 1.9 P772Ht
C. L. McCombs, T. R. Wright, V. A. Reubelt, and W. A. Radspinner, joint authors.
Tests were made with apples in 8 variations of commercially used packages and in a new lighter weight box. Relations of fruit bruising to ripeness, to handling during terminal market distribution, to tray packs, to various kinds of paper used for tier pads between layers of apples, and to heavy and light packs were studied.

396. SNITZLER, J. R. Transportation of apples in the Appalachian belt, 1952-1953. Washington, U. S. Agr. Mktg. Serv., Transportation & Facilities Res. Br., 1955. 46 p. A286.393 M34
Compares rail and truck shipments of apples by size of shipper, by States, and by mileage blocks. Gives the chief advantages and the major disadvantages of shipping apples by motortruck. The shift from rail to truck shipping stems largely from the failure of the railroads to improve services and lower rates, and this may cause the virtual disappearance of apple traffic from the railroads.

397. WOODWARD, H. C. Containers for shipping apples. Maine Agr. Expt. Sta. B. 521,19 p. Oct.1953. 100 M28S
Eleven containers of three types - wooden boxes, corrugated and wirebound - were tested for their ability to protect apples from bruising in transit. Materials used in the various tray and layer packs were studied, and containers were compared on the basis of bruising and costs.

398. WRIGHT, T. R., and SMITH, E. Fruit temperatures in commercial Northwestern apple shipments protected with automatic alcohol heaters during January and February 1951. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 249,4 p.,tables,charts. May 1951. 1.9 P772Ht
Study of transit commodity temperatures in cars moved under commercial shipping conditions in both standard and fan-equipped refrigerator cars, in good and in poor condition.

Citrus

399. BIGHAM, T. C., and ROBERTS, M. J. Citrus fruit rates; development and economic appraisal. Gainesville, U. Fla. Press, 1950. 134 p. 289.22 B48
Information for the monograph was obtained from official carrier tariffs, Interstate Commerce Commission reports, and publications of the U. S. Department of Agriculture. Presents data on production and distribution of citrus fruit, traces the development of the citrus rate structure, gives a careful comparison of rates from the different origins, and provides a thorough and exacting appraisal of the rate structure.

400. BROOKER, M. A., and GILBRAITH, K. M. Factors influencing the method of transportation used in marketing fresh Florida citrus. Fla. Agr. Expt. Sta. B. 549,80 p. Sept.1954. 100 F66S
The use of rail and water facilities has declined while use of motortrucks has increased. The factors influencing this change are quality of service, type of container used, origin area of shipment, region of destination, size of the destination city, method of sale, seasonality of movement, type of purchaser, and costs of transportation.

401. CAPEL, G. L. Costs for handling Florida oranges shipped in consumer bags and in bulk. Fla. Agr. Expt. Sta. Agr. Econ. Mimeo. Rpt. 58-12,23 p. June 1958. 281.9 F663
Considers the costs of loading and unloading bagged and bulk shipments, and the costs of the bags. Points out the possible advantages of bulk shipping.

402. CHURCH, D. E. Diversion of Florida orange traffic from rail to truck. U. S. Bur. Agr. Econ. Mktg. & Transportation Situation MTS-85:6-12. June 1950. 1.941 M8M34
Gives illustration of how the diversion was calculated and the effect of the changes.

403. GARVER, C. E., and others. A test comparing dry ice and mechanical refrigeration in the transportation of frozen citrus concentrate by motortruck; an interim report. Washington, U. S. Prod. & Mktg. Admin., Mktg. Facilities Res. Br., 1953. 23 p. 1.956 M343T282
M. V. Gerrity, J. R. Winston, and R. H. Cubbedge, joint authors. U. S. Agricultural Research Administration, cooperating.
Compared the effectiveness of dry ice as a refrigerant distributed over the load in a truck, with that obtained by mechanical refrigerating units. The latter were superior.

404. HAMRICK, D. O. Technological considerations in the bulk transportation of citrus juices. Food Technol. 12(11):579-581. Nov. 1958. 389.8 F7398
Studied the feasibility of cheaper transportation by sea from Florida to New York. Size of tanks, cargo freighters, protective linings in tanks, behavior of tanks aboard ships, and sanitary precautions are discussed.

405. HARVEY, E. M., and others. A comparison of types of containers, refrigeration and loads in the transportation of non-precooled navel oranges in half-box fiberboard cartons from central California to Chicago and New York, December 1952 and January 1953. U. S. Agr. Mktg. Serv. AMS-135,26 p.,tables,charts. Aug.1956. A280.39 M34Am
E. P. Atrops, W. A. Radspinner, J. M. Lutz, H. R. Barber, and J. A. Scanlon, joint authors.
Originally issued as U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 293,26 p. May 1953. 1.9 P772Ht
Determined to what extent vented types of cartons would alleviate the difficulty of cooling nonvented all-carton loads.

406. HARVEY, E. M. Cooling and transportation problems of citrus fruits packed in fiberboard cartons. Conf. Transportation Perishables. Proc. 1954:54-58. 280.39 C765
Problems such as refrigeration in transit of warm-loaded oranges

packed in cartons, load patterns and air channels, and precooling are discussed.

407. HARVEY, E. M., and others. Shipping and cooling-in-car tests with oranges in fiberboard cartons in different load patterns, 1953. U. S. Agr. Mktg. Serv. AMS-2,37 p.,tables, figures. Nov.1954. A280.39 M34Am

E. P. Atrops, H. W. Hruschka, and H. R. Barber, joint authors.

The general results from precooling tests were considered unsatisfactory. It seemed probable that improvement might come from redesigning the cartons. If the vents in the tops and bottoms of the cartons could be placed nearer to the corners of the sides, better flow of air might be expected.

408. HARVEY, E. M., and ATROPS, E. P. Shipping tests with California citrus fruit from Los Angeles to Rotterdam. U. S. D. A. Mktg. Res. Rpt. 219,26 p. Feb.1958. 1 Ag84Mr

Observations on fruit at arrival in six shipping tests indicated that stowage patterns and ventilation facilities in ships should be changed when fiberboard cartons were used. The fiberboard had insulating properties and stowed more compactly, which reduced circulation and increased spoilage.

409. HARVEY, E. M., and others. Shipping tests with precooled Valencia oranges in half-box size fiberboard cartons from southern California to New York, August and September 1952. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 283,18 p.,tables. Dec. 1952. 1.9 P772Ht

E. P. Atrops, H. W. Hruschka, and J. A. Scanlon, joint authors.

Tests indicated that precooled oranges in sealed cartons presented no special problem in transit refrigeration and that cars equipped with both fans and wall flues showed a clear advantage.

410. HARVEY, E. M., and others. Shipping tests with Washington navel and Valencia oranges under half-stage and full-bunker refrigeration from southern California, May and June 1948. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 193,8 p.,charts. July 1948. 1.9 P772Ht

E. P. Atrops, J. Kaufman, J. R. MacRill, and J. A. Scanlon, joint authors.

Results indicate strongly that with judicious choice of basic icing service, half-stage refrigeration may be used safely during the spring months for oranges that were not precooled.

411. HARVEY, E. M., ATROPS, E. P., and RADSPINNER, W. A. Shipping tests with Washington navel oranges, comparing ventilation behavior of the 561- and the 462-box loads from southern California, January and February 1950. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 227,4 p.,charts. May 1950. 1.9 P772Ht

Results showed so little difference between the average temperatures of the two types of load that no need of modification was indicated.

412. HARVEY, E. M., and others. Shipping tests with Washington navel oranges under half-stage and full-bunker refrigeration from Tulare County, California, December 1947. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 187,7 p.,tables,figures. Mar. 1948. 1.9 P772Ht

E. P. Atrops, J. R. MacRill, and W. C. Waid, joint authors.
Found that it is entirely practicable to employ half-stage icing with whatever icing rule the shipper prefers, at a saving of 22 percent of the full-bunker icing charge and obtain nearly equivalent refrigeration.

413. HARVEY, E. M., ATROPS, E. P., and FRIEDMAN, B. A. Tests on the refrigeration of lemons in transit from California to New York, June 21-30 and July 19-29, 1949. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 217, 5 p., tables, charts, Sept. 1949. 1.9 P772Ht
Boxes of lemons were shipped in extremely hot weather to test re-icing needs en route, and ice saving by modified air circulation in the car.

414. HARVEY, E. M., and REDIT, W. H. Transportation of frozen citrus concentrates and other frozen foods. Food Technol. 9(2):74-77, illus. Feb.1955. 389.8 F7398
Results of three years of testing with refrigerated trucks relating to the use of air blowers, dry ice, airspace, honeycombed-paper pallets, and temperatures.

415. HARVEY, E. M., ATROPS, E. P., and RADSPINNER, W. A. Transportation test with lemons and oranges from southern California to New York, September 1950. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 233,34 p., tables, charts. Nov.1950. 1.9 P772Ht
Studied the refrigeration performance of fan and nonfan cars receiving various icing services when fruit was packed in standard 464-box load. Lemons were warehouse-cooled while oranges were not precooled. There was no evidence of differences in fruit quality due to the different types of refrigeration used.

416. HARVEY, E. M., and others. Transportation test with lemons and oranges in half-box size fiber board cartons from southern California to New York, July 1952. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 281,12 p., tables, charts. Sept.1952. 1.9 P772Ht
E. P. Atrops, W. A. Radspinner, and H. W. Hruschka, joint authors.
Studied the refrigeration behavior of the half-box fiberboard carton in different load patterns and combinations with standard boxes. Concluded that citrus in cartons should be shipped in fan cars, and that oranges in cartons must be precooled before packing to be shipped safely.

417. HARVEY, E. M., and others. Transportation test with lemons from southern California to New York, May 1949. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 214, 5 p., tables, charts. July 1949. 1.9 P772Ht
E. P. Atrops, W. H. Redit, and B. A. Friedman, joint authors.
A study of the refrigeration performance of some of the less complete and less expensive icing services during the transition period of late spring or early summer when changes are made from ventilation to ice refrigeration.

418. HARVEY, E. M., and others. Transportation test with lemons from southern California to New York, August 1951. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 260, 6 p., tables, charts. Oct.1951. 1.9 P722Ht

E. P. Atrops, J. Kaufman, and J. R. MacRill, joint authors.
Fifteen carloads of warehouse-cooled lemons were studied to determine the most economical icing services adequate for hot weather shipments.

419. HARVEY, E. M., and others. Transportation test with Washington navel oranges, comparing ventilation behavior of the 561- and the 462- box loads from central California to New York, January 1951. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 242,6 p.,tables. May 1951. 1.9 P772Ht
E. M. Harvey, E. P. Atrops, J. Kaufman, and J. R. MacRill, joint authors.
The two different-sized loads cooled at nearly the same rate. Cooling in car by night air showed some advantages. Cooling by ice refrigeration in four cars was adequate but somewhat inferior to combination ventilation with fans.

420. HATTON, T. T., and WINSTON, J. R. Overseas ventilated-shipping tests with Florida oranges and grapefruit. U. S. D. A. Mktg. Res. Rpt. 274,20 p. Sept.1958. 1 Ag84Mr
The feasibility of commercially shipping citrus fruits to European markets without refrigeration in March, April, and May 1957 was tested. Shipment under ventilation was not suitable for oranges at that season, and not good for grapefruit.
The effectiveness of different chemical treatments to inhibit decay was compared.

421. HOOFNAGLE, W. S., BROOKER, M. A., and GILBRAITH, K. Transporting Florida fresh citrus fruit to market. U. S. Agr. Mktg. Serv. Mktg. & Transportation Situation MTS-113:14-18. May 1954. 1.941 M8M34
Summarizes the results of a study by the U. S. Department of Agriculture and the Florida Agricultural Experiment Station.

422. JOHNSON, H. D., and others. Test of a refrigerated truck trailer equipped with a dry ice system of refrigeration using a secondary refrigerant; an interim report. Washington, U. S. Prod. & Mktg. Admin. Mktg. & Facilities Res. Br., 1953. 15 p.
1.956 M343T283
C. E. Garver, J. R. Winston, and R. Cubbedge, joint authors.
U. S. Agricultural Research Administration, cooperating.
Cost and consumption of dry ice, and temperatures at top and bottom of load were recorded in a transit test of frozen citrus concentrate between Florida and Philadelphia.

423. KAUFMAN, J., HARDENBURG, R. E., and LUTZ, J. M. Weight losses and decay of Florida and California oranges in mesh and perforated polyethylene consumer bags. Amer. Soc. Hort. Sci. Proc. 67:244-250. 1956. 81 So12
The Florida oranges were shipped in wirebound crates and the others in fiberboard boxes with fungistatic diphenyl pads. A retail and a wholesale method of holding prepackaged oranges were simulated. Oranges packaged in meshbags and stored loose lost the most weight but developed the least decay.

424. NEILL, R. C. Efforts of the citrus industry to prevent transit losses. Conf. Transportation Perishables. Proc. 1954:34-38. 280.39 C765
Shippers can take three preventitive measures to reduce transit

losses by shipping only sound fruit, by stowing the containers in the cars as recommended in freight container tariffs, and by selecting the proper type of protective service for the fruit while en route.

425. PROSSER, D. S., and others. Bulk handling of fresh citrus fruit. Fla. Agr. Expt. Sta. B. 564,35 p. June 1955. 100 F66S
W. F. Grierson, E. Thor, W. F. Newhall, and J. K. Samuels, joint authors.
Describes a system of bulk handling for packinghouses, three variations of which are being used commercially. Some of the advantages listed are elimination of the wooden field box, reduction in labor, improved morale and working conditions, increased capacity of degreening rooms, even flow of fruit, and direct savings per box.

426. PURCELL, M. R. Transportation of Florida frozen orange juice concentrate; a case study of carrier competition induced by dynamic industry growth. U. S. Agr. Mktg. Serv. AMS-50,83 p. May 1955. A280.39 M34Am
The principal competitive problems of the motor and the rail carriers and the factors influencing shippers' choice of carrier service are discussed. Differences in hauling rates by rail and by truck are shown in table 8.

427. RADSPINNER, W. A., and HARDING, P. L. The effect of containers on the storage of Florida oranges at terminal markets, 1952. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 287,7 p.,tables. Feb.1953. 1.9 P772Ht
Studied the effect of containers on transit temperature, on decay, on skin breakdown, on flavor, and on profit and loss from storage, and also the effect of storage on fiberboard cartons (half-box size).

428. REDIT, W. H., and others. Transportation of frozen citrus concentrate by railroad and motortruck from Florida to northern markets. U. S. D. A. Agr. Inform. B. 62,77 p.,tables,charts. June 1951. 1 Ag84Ab
H. D. Johnson, J. D. Hall, R. Cubbedge, and J. Kaufman, joint authors.
The study dealt with temperature variations in transit in different parts of loads, when different refrigeration services were used.

429. SELTZER, R. E. Bulk-handling compared with the use of field boxes in the harvesting of desert grapefruit. Ariz. Agr. Expt. Sta. Mimeo. Rpt. 89,7 p.,illus. Mar.1949. 100 Ar4M
Hauling costs shown in tables are broken into such items as oil, gas, truck repair, labor, insurance, and taxes.

430. SMITH, R. J. Citrus packaging. Conf. Transportation Perishables. Proc. 1954:46-54. 280.39 C765
Eight methods of shipping discussed are: 1, Bulk; 2, Loose box; 3, Bulk (prepackage); 4, Prepackage in mother container; 5, Bruce box; 6, Nailed box; 7, Corrugated half-box; and 8, Bulk bins.

431. SPURLOCK, A. H. Costs of picking and hauling Florida citrus fruits, 1957-58 season. Fla. Agr. Expt. Sta. Agr. Econ. Mimeo. Rpt. 59-10,16 p.,tables. Feb.1959. 281.9 F663
This is the eighth annual summary of this series. It gives average costs per box for hauling, broken down into a number of components for trucks, labor, operation, and miscellaneous costs, based on a

sample of dealers and packers. Also gives capital investments for trucks and boxes and other equipment.

432. WINSTON, J. R., and others. A comparison of protective services commonly used for rail shipments of Florida oranges and grapefruit. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 305,39 p.,tables,charts. Sept.1953. 1.9 P772Ht
H. W. Hruschka, R. H. Cubbedge, and G. A. Meckstroth, joint authors.
Six hundred shipping tests were made during three seasons to compare the load temperatures during transit obtained by commonly-used protective services grouped by shipping periods, and the effect of such temperatures on the keeping qualities of the fruits during transit and for a week after it reached market. The study covered precooling, various types of icing, refrigeration, and ventilation as well as containers.

433. WINSTON, J. R., HRUSCHKA, H., and CUBBEDGE, R. Effect of packinghouse treatments, temperatures in transit and containers on decay in tangerines. U. S. Agr. Mktg. Serv. AMS-125,37 p. Mar. 1958. A280.39 M34Am
Originally issued as U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 263,37 p. Mar.1952. 1.9 P772Ht
Appraised the value of decay inhibitors, compared the different in-transit protective services used in rail shipments, and studied the differences in temperature and development of decay between loads of treated cartons and wirebound crates.

434. WINSTON, J. R., and CUBBEDGE, R. H. Export shipping tests to Europe with Florida citrus fruit. U. S. D. A. Mktg. Res. Rpt. 321,43 p.,illus. 1 Ag84Mr
The study was made to determine the effect of quality of fruit packed, kind of package, precooling, fungicidal treatments, and temperatures on board ship on condition of the fruit at destination. Cartons varied considerably in their resistance to damage. Condition of the fruit upon arrival in Europe varied, but precooling was a factor in maintaining proper temperatures.

435. WINSTON, J. R. Harvesting and handling citrus fruits in the Gulf States. U. S. D. A. Farmers' B. 1763,67 p. Rev. July 1950. 1 Ag84F
Transportation, p. 44-51, deals with rail, water, and motortruck transportation, refrigeration, size and types of loads.

436. WINSTON, J. R., and others. Rail refrigeration test with Florida citrus, November, 1950. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 277,34 p.,tables. June 1952. 1.9 P772Ht
R. Cubbedge, H. W. Hruschka, and G. A. Meckstroth, joint authors.
Compared the various protective services in common use with loads in fan and nonfan double-deck cars, meshbags over wirebound crates and solid loads of crates in the regular cars.
Also in condensed form in Citrus Indus. 33(11):11-13,15,18. Nov. 1952. 80 C49

437. WINSTON, J. R., and others. Rail refrigeration test with Florida citrus, April 1951. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 279,28 p.,tables,charts. Sept.1952. 1.9 P772Ht

R. Cubbedge, H. W. Hruschka, and G. A. Meckstroth, joint authors. Compared the effects of various icing services, fan and nonfan cars, precooling of fruit before and after loading, crates and bags as containers, and rind breakdown and decay as related to commodity temperature during transit.

438. WINSTON, J. R., and others. Rail refrigeration tests with Florida citrus, May 1951. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 280, 44 p., tables, charts. Sept. 1952. 1.9 P772Ht
R. Cubbedge, H. W. Hruschka, and G. A. Meckstroth, joint authors. Compared temperatures in transit for fruit that was room-precooled with fruit precooled after loading, under different icing services, in fan and nonfan cars, in nailed crates and meshbags. No correlation was found between temperature in transit, loading or packaging methods.

439. WINSTON, J. R., and KAUFMAN, J. Rail refrigeration tests with Florida citrus; a comparison of refrigerator cars. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 282, 14 p., charts. Oct. 1952. 1.9 P772Ht
Compared overhead bunker cars with end bunker cars when equipped with floor fans or with no fans, as to speed of temperature reduction during transit.

440. WINSTON, J. R. Refrigerating frozen citrus concentrate during transit. Citrus Processing Conf. Program & Abs. Papers 3: 14-16. Oct. 1953. 1.932 A4Ab8
Tests in railroad cars and in trucks with ice, dry ice, and mechanical refrigeration.

441. WINSTON, J. R., CUBBEDGE, R. H., and KAUFMAN, J. Shipping Florida citrus fruit in wirebound crates and cartons; a comparison of commercial practices. U. S. Agr. Mktg. Serv. AMS-342, 15 p. Oct. 1959. A280.39 M34Am
Under spring and summer conditions, mechanically refrigerated cars seemed as satisfactory as ice-refrigerated, fan-equipped cars for the transport of citrus loaded while warm and cooled during transit. Loading patterns varied for the crates and cartons. Tables show icing services, temperatures in transit, ice meltage, and rind breakdown and decay upon arrival.

Melons

442. ASSOCIATION OF AMERICAN RAILROADS. REFRIGERATOR CAR RESEARCH. A. A. R. Report no. 32, reporting separately various types of refrigerator service commonly used in the transportation of cantaloups in 40 refrigerator cars originating in the Imperial Valley, at Yuma, Ariz., and at Phoenix, Ariz., and moving towards eastern destinations during June and July 1949. Final report. Chicago, 1949. 55 p., illus, charts. 295 As7A
Found that top or body icing with bunker ice produced more even and desirable temperatures for the transportation of ripe cantaloups than could be obtained by other services, and that the use of salt in re-icing was unnecessary and might cause freezing damage.

443. BREAKIRON, P. L., and others. Crosswise loading of long-type watermelons. U. S. D. A. Mktg. Res. Rpt. 133,35 p.,illus. July 1956. 1 Ag84Mr

J. R. Winston, J. Kaufman, and C. B. Earle, joint authors.

Shipping experiments by rail from the southeast to northern markets showed a large reduction in bruising, cracking, and scarring of long-type melons loaded crosswise of the car as compared with those loaded lengthwise.

Also (Preliminary results) in Fla. State Hort. Soc. Proc. 67:137-139. 1954. 81 F66

444. BREAKIRON, P. L., WINSTON, J. R., and KAUFMAN, J. Studies of watermelon loading for rail shipment, 1953. U. S. D. A. Mktg. Res. Rpt. 62,27 p. May 1954. 1 Ag84Mr

Shipping tests with 110 carloads showed that loading the melons crosswise of the car resulted in 70 percent less bruising, 69 percent fewer cracked melons, and 47 percent less surface scaring than in comparable shipments loaded lengthwise. The majority of bruised melons were found in the ends of the cars.

445. GERRITY, M. V., and BREAKIRON, P. L. Loss and damage in rail transportation of watermelons in relation to variety of melon, type of car, and type of protective material. Washington, U. S. Prod. & Mktg. Admin. Mktg. & Facilities Res. Br., 1950. 31 p. 1.956 M343L89

The extent of loss and damage is shown in tables. Fewer melons were damaged in ventilated boxcars than in any other type. Refrigerator cars also had low rates, while those in stock cars suffered most. Hay, straw, excelsior pads, and paper were evaluated for sidewall and end protection in the cars.

446. HAILEY, J. R. Watermelon losses—the remedy. Conf. Transportation Perishables. Proc. 1954:126-133. 280.39 C765

Includes losses due to poor methods of loading, lack of sufficient excelsior for floor bedding, fragile varieties, and diseases.

447. JENSEN, W. S. Watermelons - destination damage and what it means to grower, shipper, consignee and rail carriers. Watermelon Growers & Distrib. Assoc. Proc. 35:38-43. 1949. 280.3939 W31

Suggests the following four approaches in eliminating preventable damage: 1, Pack the melons in containers; 2, pack sufficient protective material around and between the melons; 3, produce varieties of melons which are good shippers; 4, apply the principle of "normal expectancy" of physical damage to melons shipped in bulk.

448. MELON clinic; a symposium. Conf. Transportation Perishables. Proc. 1956:120-136. 280.39 C765

Papers on transportation are: Method of loading and breakage of watermelons, by G. A. Border; Remarks on melon shipping problems in fiberboard containers, by F. K. Vasiliou; and Modified refrigeration of honeydews, by A. L. Ryall.

449. PRATT, H. K., and others. Tests of modified protective services in the transportation of honey dew melons from California to New York City, 1955 and 1956. Calif. U. Dept. Veg. Crops. Veg. Crops Ser. 90,15 p. Aug. 1957. 81 C1255

L. L. Morris, A. L. Ryall, and B. A. Friedman, joint authors. Shipping tests were conducted to evaluate: 1, The effectiveness of half-stage vs. full-bunker icing; 2, the frequency and amount of re-icing needed in transit; and 3, the possibility of shipment on the day of loading with ethylene treatment en route.
Results showed that half-stage standard refrigeration in fan-equipped cars gave sufficient protection in even the hottest season.

450. SHIPPING of melons; a symposium. Conf. Transportation Perishables. Proc. 1958:110-122. 280.39 C765
Contains summaries of seven papers by B. E. Giovannetti, H. K. Pratt, S. Pilibos, J. K. Stewart and W. J. Lipton, A. M. Fielding, R. H. Lamb, and G. N. Davis. They deal with refrigeration, containers, precooling, and load arrangements of cantaloups, honeydews, and watermelons.

451. WINTER, J. C., and MASTERS, B. M. Loss and damage in the transportation of cantaloups, 1950-1952. A summary of research findings on transit damage, loading time, and materials costs under various methods of loading. Washington, U. S. Prod. & Mktg. Admin. Mktg. & Facilities Res. Br., 1953. 23 p. 1.956 M343L893
Western Growers Association cooperating.
Loading cantaloup crates on end in rail cars instead of lengthwise on sides was found to cut losses from container breakage by two-thirds and injuries caused by bruising of fruit by one-third. Methods and time required for loading, stripping, and bracing were studied to find the best systems.

452. WINTER, J. C. Reduction of cantaloup loss and damage in rail transportation through use of the upright loading method; an interim report. Washington, U. S. Prod. & Mktg. Admin. Mktg. & Facilities Res. Br., 1951. 16 p. 1.956 M343R242
By loading the containers on end, the shorter and heavier end frames absorbed the severe lengthwise shocks rather than the longer and more fragile side slats, and breakage was only one-third of that in the lengthwise loads.

Peaches

453. BREAKIRON, P. L., and HOECKER, R. W. A comparative study of packing, transportation, and refrigeration costs of bushel baskets and wire-bound boxes for transportation of peaches. Washington, U. S. Prod. & Mktg. Admin. Mktg. & Facilities Res. Br., 1950. 22 p.,illus. 1.956 M343C73
Compared the relative loss and damage to baskets and boxes, bruising damage to fruit, cooling rates in transit, shipping costs, effective utilization of loading space, and relative packing costs of the two containers. The Spartan wirebound box was superior.

454. CAMMEYER, G. D. Marketing Georgia peaches; summary of 1958 season. Washington, U. S. Agr. Mktg. Serv., 1959. 35 p. 1.9 Ec741L
Georgia Department of Agriculture cooperating.
Chiefly statistical tables showing rail and truck shipments to given points, peach unloads in 100 cities by State of origin, and terminal market jobbing prices by types of fruit and by cities.

455. CAMP, T. H. Better loading methods for truck shipments of peaches in tub-type baskets. U. S. D. A. Mktg. Res. Rpt. 420, 20 p., illus. Aug. 1960. 1 Ag84Mr

Research with Georgia and South Carolina peaches shipped in motor-trucks and in alternately inverted loads in 1/2-, 3/4-, and 1-bushel baskets. The greater density of the alternately inverted load made it possible to get more containers in the same space in the vehicle, thereby reducing transportation and refrigeration costs per bushel.

456. CROW, W. C. Transportation of peaches. Natl. Peach Council. Peach Annu. 1949:34-36. 281.3939 N21

Points out that the truck is a necessary part of the marketing process, that trucking must be kept flexible, safe, and low in cost.

457. GIN, J. L. Prepackaging firm-ripe peaches; an interim report. U. S. Agr. Mktg. Serv. AMS-312, 48 p. June 1959. A280.39 M34Am

It cost more to prepackage peaches than to bulk-pack them, but resulted in less transit bruising of riper fruit. The study was made in six States in 1956, 1957, and 1958. Several types of consumer packages were used and packed in wirebound master shipping containers, or in fiberboard and veneer master shipping containers, and compared with bulk packing in 3/4-bushel baskets. Costs of labor, materials, loading, and packing are shown, and labor requirements in minutes is given for each operation in tables 2 and 3.

458. HALLER, M. H., and others. Peach precooling tests - 1951. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 276, 4 p., tables. June 1952. 1.9 P772Ht

W. A. Radspinner, S. E. Womeldorph, M. A. Smith, and W. R. Wright, joint authors.

Peaches were packed naked in half-bushel ventilated baskets and loaded in fan cars. Precooling for short periods with ice and fans or with compressor units was of little benefit.

459. HALLER, M. H., and others. Test shipments of Elberta peaches from South Carolina to New York, 1948. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 199, 16 p., illus., tables. Jan. 1949. 1.9 P772Ht

M. A. Smith, J. Kaufman, and V. A. Reubelt, joint authors.

Tests did not show any appreciable reduction in bruising from the use of smaller containers (1/2-bushel baskets compared with bushel baskets) or from the use of extended stave baskets compared with standard baskets. The rate of cooling was not increased from added ventilation through the top of the basket.

460. HALLER, M. H., and others. Test shipments of peaches from South Carolina to New York, 1949. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 223, 14 p., tables. Mar. 1950. 1.9 P772Ht

S. E. Womeldorph, B. A. Friedman, and M. A. Smith, joint authors.

To determine the amount of bruising and the rate of cooling, fruit was shipped in bushel boxes and 1/2-bushel baskets in fan cars, and in bushel baskets in nonfan cars, in tub baskets to test the degree of fill on bruising, and in a truck to compare the 1/2-bushel box, peach lug, and bushel basket.

461. REDIT, W. H., and SMITH, M. A. Precooling South Carolina peaches, 1953. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 306,14 p.,charts. Nov.1953. 1.9 P772Ht
The fruit was precooled in rail cars with bunker ice and portable fans, in a mechanically refrigerated car, and also hydrocooled. The effect of precooling on ripening and on control of decay during transit was studied.

462. REDIT, W. H., SMITH, M. A., and BENFIELD, P. L. Tests on hydrocooling and refrigeration of peaches in transit from Georgia and South Carolina, 1954. U. S. Agr. Mktg. Serv. AMS-62,24 p. July 1955. A280.39 M34Am
Both commercial and homemade hydrocoolers were tested, all using ice refrigeration. One mechanically refrigerated hydrocooler and one tank-type hydrocooler also were tested. Loading temperatures were maintained satisfactorily in transit.

463. SMITH, W. L., and others. Peach hydrocooling, shipping, and fungicidal tests. I-II. U. S. Agr. Mktg. Serv. AMS 199,20 p. July 1957. A280.39 M34Am
G. B. Ramsey, M. J. Ceponis, and W. H. Redit, joint authors.
I, Tests of Pennsylvania peaches, 1955; II, Tests of South Carolina peaches, 1956.
The tests measured the effect of transit temperatures on ripening and bruising of peaches shipped at different maturities. They also gave information on the reduction of fruit temperatures as a result of commercial hydrocooling, and on the reduction of decay by Dowicide A and by chlorine when used in hydrocooling water.

464. STEVENS, G. A. Extent and nature of bruising of Maryland peaches from the orchard to the retail store. College Park, Md., 1957. 163 p.
Thesis (Ph. D.) - University of Maryland, 1957.
Abstract in Diss. Abs. 17(11):2360. Nov.1957. 241.8 M58
Measured bruising from orchard to packinghouse, from packinghouse to retail store, and compared the effect of the field crate and the bushel basket on bruising.

Pears

465. DAVIS, G. B., and FORTNER, L. U. Cost and efficiency studies in marketing Oregon pears. I. Comparative costs of handling winter pears in fiberboard and wood containers. Oreg. Agr. Expt. Sta. Misc. Paper 42,10 p.,illus. May 1957. 100 Or3M
Labor costs and labor requirements were about the same for two kinds of fiberboard cartons and the standard wooden box. It included labor used for car loading. The costs of the containers were different. Deals chiefly with handling costs at shipping points.

466. HARVEY, J. M., and others. Studies of modified protective services for Bartlett pears, 1959 season. U. S. Agr. Mktg. Serv. AMS-385,11 p. June 1960. A280.39 M34Am
M. Uota, S. M. Ringel, and F. L. Cook, joint authors.
Studies of transit temperatures and ripening of pears shipped from California to New York by rail, included precooling, re-icing, and costs of shipping under different refrigeration services.

467. JONES, G. W. Pre-cooling Bartlett pears for bulk shipment in refrigerated rail cars. Conf. Transportation Perishables. Proc. 1958:48-51. 280.39 C765

Based on experiments with 11 cars, the author recommended the top ice method of cooling when a large volume of pears was to be shipped in bulk. All cars were preiced before loading and shipped with standard refrigeration of 2 percent salt. Narrow openings in the floor racks were necessary to reduce bruising.

468. LAMBERT, W. A. The case for a lighter channel load. Conf. Transportation Perishables. Proc. 1953:68-71. 280.39 C765

Attributes decline in consumer acceptance of Early Bartlett pears to shipment in the heavy, solid load at relatively low temperatures, and arriving green. Suggest a lighter, channel load for summer shipment to deliver the pears in best possible condition.

469. MITCHELL, F. G. 1957 transit tests of vibrator-packed pears. Conf. Transportation Perishables. Proc. 1958:82-84. 280.39 C765

Describes tests made in 1957 to compare nonwrapped vibrator-packed Bartlett pears in cartons with wrapped pears in standard wooden boxes, shipped from California to Connecticut by rail.

470. RADSPINNER, W. A. Ripening of pears in fan cars. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 203, 5 p. Feb.1949. 1.9 P772Ht

Pears from Oregon were ripened in the car after arrival in New York in January. Describes the load pattern and indicates the rise in fruit temperature throughout the load during the heating period.

471. RADSPINNER, W. A., and others. Ripening pears in fan cars at the terminal market. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 222, 8 p., charts. Mar.1950. 1.9 P772Ht

S. E. Womeldorph, J. S. Wiant, and W. H. Redit, joint authors. The test demonstrated the possibility of ripening winter pears in fan cars after arrival at the market.

472. REDIT, W. H., and others. Ripening pears in fan cars during transit. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 221, 4 p., tables, charts. Feb.1950. 1.9 P772Ht

S. E. Womeldorph, W. A. Randspinner, and J. S. Wiant, joint authors.

The feasibility of ripening western pears between Chicago and New York was determined in this test of freight cars heated with either alcohol or charcoal heaters.

473. REDIT, W. H., RADSPINNER, W. A., and WIANT, J. S. Ripening pears in transit in fan cars. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 234, 20 p., tables, charts. Mar.1951. 1.9 P772Ht

In five freight cars of Bosc pears shipped from Oregon to New York City, a standard type of charcoal heater instead of a thermostatically controlled heater was tested to find a desirable temperature for ripening during transit.

474. RYALL, A. L., and others. A comparison of transit protective services for Bartlett pears during the early part of the shipping season. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 232, 8 p., tables, charts. Oct.1950. 1.9 P772Ht

J. R. Clements, W. A. Radspinner, F. W. Allen, and R. W. Harrison, joint authors.
The protective services studied in eight refrigerator cars involved preicing, precooling after loading, re-icing, and various amounts of air circulation, to allow for partial ripening of pears in transit and still provide adequate protection against overripeness and decay.

475. RYALL, A. L., RADSPINNER, W. A., and ALLEN, F. W. Further studies of transit protective services for California Bartlett pears. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 262, 8 p., tables, charts. Feb. 1952. 1.9 P772Ht
Shipping tests were made to determine suitability of modified half-stage icing services in fan cars for pears shipped to New York City. Records were kept of transit temperatures as related to ripening response.

476. RYALL, A. L., and KAUFMAN, J. Modified refrigeration and ethylene treatments for Bosc pears; ripening en route. West. Fruit Grower 11(8):39-41. Aug. 1957. 95.8 G762
Preshipment ethylene treatments and modified services were compared with conventional methods of handling in 10 cars shipped from California to New York. Results are shown in 4 tables and 4 figures.

477. SAINSBURY, G. F., and SCHOMER, H. A. Influence of carton stacking patterns on pear cooling rates. U. S. D. A. Mktg. Res. Rpt. 171, 10 p. Apr. 1957. 1 Ag84Mr
In tests of a new type of fiberboard carton for storing and shipping Anjou pears, it was found that stacking arrangements with this carton could affect the cooling of the pears, and consequently their condition at the end of the storage period.

478. SOMMER, N. F. Pear transit simulated in test; four varieties of pears included in experiments to evaluate ability of containers to withstand damage and protect fruit. Calif. Agr. 11(9):3-5, 16. Sept. 1957. 100 C12Cag
Nonwrapped jumble packed pears in fiberboard cartons did not suffer more damage when pads were compressed over the fruit by a tightly fastened lid, than wrapped fruit in standard wooden boxes.

Grain and Grain Products

478a. AGRICULTURAL INDUSTRIES FORUM; GRAIN MARKETING. Proceedings, second, February 2-3, 1960. Ill. U. Col. Agr. Dept. Agr. Econ. AE-3524, 28 p. 275.29 IL62P
Sponsored by University of Illinois, College of Agriculture, Department of Agricultural Economics, in cooperation with Division of University Extension.
Contents: General history and theory of the railroad grain rate structure, by J. C. Winter, p. 1-7; Postwar rate changes affecting Illinois grain, by C. J. Lessing, p. 8-18; Transportation problems of the location of plants and facilities, by H. N. Johnson, p. 19-22; Coordinating rail, truck and water grain rates, by R. M. Freeman, p. 23-28.

479. AMOS, J. M., SHARP, J. W., and DUBEY, A. The St. Lawrence Seaway and Ohio's wheat. Ohio Agr. Expt. Sta. Dept. Agr. Econ. & Rur. Sociol. A. E. Ser. 305, 13 p. May 1959. 281.9 Oh32
Points out that country elevators around the seaports will have to

make adjustments in the handling of grain through introducing new techniques or by equipping themselves with their own trucks.

480. AUGHNAY, F. P. Freight rate increases and their effect on the Northwest wheat industry. Oreg. Wheat Growers League. Proc. 24:33,35,37,39,41,43. 1951. 59.9 Ea73
Discusses the shrinkage in shipments of wheat and flour to eastern destinations and to California and reduction in freight revenue between 1946 and 1951 due to rise in rates.

481. BAKKEN, H. H., and OLIVIERI, J. A. Moving grain on rubber and rails - Wisconsin 1958. Madison, U. Wis. Col. Agr. Dept. Agr. Econ., 1958. 30 p. A280.359 W75
Tables show the quantities of corn, oats, wheat, and soybeans shipped by rail and by truck, amounts trucked out-of-State, by origin and by destination. Costs of transportation per mile within the State are shown in table 11.

482. BAKKEN, H. H., and OLIVIERI, J. A. So goes our grain in Wisconsin - 1959. Madison, U. Wis. Col. Agr. Dept. Agr. Econ., 1959. 26 p. Private file
Survey shows quantities of grain shipped by motortruck from Wisconsin elevators during the year, and includes out-of-State destinations.

483. BARRY, E. J. The Seaway shifts grain movements. Co-op Grain Q. 15(1):18-22. June 1957. 280.28 C7898
Gives probable future effects of the Seaway. Based on a study at Indiana University by J. R. Hartley entitled Effects of the St. Lawrence Seaway on grain movements.

484. BENSON, H. J. Farm delivery of feed in bulk. East. Feed Merchant 3(1):25-27,64,66-67,illus. Jan.1952. 389.78 Ea7
Describes the various types of trucks used and methods of bulk feed delivery to farms, involving savings to feedman and farmer. Suggests the keeping of accurate cost records.

485. BERG, K., SORRELL, L. C., and ZIEBARTH, C. F. Costs of unloading and elevating grain from rail cars and motor trucks, respectively, at North Pacific Coast terminal tidewater elevators during crop year 1954-1955. Seattle, U. Wash. Bur. Business Res., 1955. 50 p. 280.359 W273
Tables show unit costs, including labor, rentals, and administration per bushel at eight elevators. Recommendations for appropriate charges for unloading and elevating wheat from rail cars and from motortrucks, respectively, based on cost findings are given on p. 14-25. Appendix IV, The costs of unloading and elevating wheat, p. 34-45.

486. BLUESTONE, H. Barges carry corn to southeast broilers. U. S. Agr. Mktg. Serv. Agr. Situation 43(4):6-7,map. Apr.1959. 1 Ec7Ag
Waterborne commerce on the Mississippi and Tennessee Rivers to the broiler producing States from the Corn Belt States.

487. BRENSIKE, V. J. Factors influencing competition among flour mills in the Pacific Slope States. U. S. D. A. Mktg. Res. Rpt. 362,64 p.,tables. Aug.1959. 1 Ag84Mr
Transportation costs are considered and freight rates are discussed in relation to quantity of wheat and flour shipped to various markets.

Several tables show rail rate increases, influence of rail and water transportation on quantity of flour shipped over a period of years, price support differentials between Portland and other terminal markets, per bushed, 1938-1956.

488. BROWN, A. A. Freight rates on feed; Central Territory origins to New England and the Middle Atlantic States. Mass. Agr. Expt. Sta. B. 508,54 p.,maps. Ref. July 1959. 100 M38H
This is the first of three studies and is concerned chiefly with the rate structure in the area east of the Mississippi and north of the Ohio-Potomac Rivers. It indicates a need for basic changes in the structure, regardless of any threat posed by other forms of transportation. One section deals with transit privileges.

489. CHURCH, D. E. Transportation of grain through terminal and storage elevators 1957. Washington, U. S. Bur. Census, Transportation Div., 1959. 23 p.,tables. 157.4 T682
Railroads transported 68 percent of the inbound and 70 percent of the outbound tonnage of grain. Trucks carried 19 percent of the grain into elevators, but only 7 percent of the outbound tonnage. Water carriers handled 15 percent inbound and 13 percent outbound. This survey measured the "line-haul" on nonlocal transportation of grain.

490. DAHL, R. P., EHRICH, R. L., and HERDER, R. J. Truck shipment of grain by Minnesota country elevators. Minn. U. Inst. Agr. Dept. Agr. Econ. Rpt. 513,27 p.,maps,tables. Oct.1958. 281.9 M66
Data are based on a sample of 76 elevators, and includes receipts and sales of corn, soybeans, oats, barley, and wheat. Contains detailed statistics on grain trucking by crop reporting districts and by grains. Considers economic implications of the change from rail to truck transport and its impact on terminal markets, grain exchanges, and boards of trade that depend on service charges on grain receipts for their operating income.

491. DAHL, R. P., HYSLOP, J. D., and KEEFE, D. R. Truck shipment of grain by Minnesota country elevators, 1958-59. Minn. U. Inst. Agr. Dept. Agr. Econ. Rpt. 517,17 p.,maps,tables. July 1960. 281.9 M66
Data for corn, soybeans, oats, barley, and wheat.

492. DUBEY, A. The effects of the St. Lawrence Seaway on Ohio wheat marketing. Columbus, Ohio State U., 1958. 138 p.
Abstract in Diss. Abs. 19(4):691. Oct.1958. 241.8 M58
Thesis (Ph. D.) - Ohio State University,
Deals chiefly with transportation of wheat. Estimates that grain movement on the Seaway by 1965 will be about 17 million tons. The truck-water combination rate in the northwestern half of Ohio will be lower than the rail export rate was in 1958.

493. FARRELL, K. R. Economic aspects of grain storage in north central United States. Ames, Iowa State Col., 1959. 222 p.
Abstract in Diss. Abs. 19(8):1882. Feb.1959. 241.8 M58
Thesis (Ph. D.) - Iowa State College.
Interregional transportation costs in 1954, were one of four factors in determining the least costs location of commercial storage stocks in ten North Central States.

494. FARRIS, P. L. Truck movement of grain and feed in Indiana. Ind. Agr. Expt. Sta. Res. Mimeo. EC-158,31 p.,tables. Dec.1958. 100 In2Ag
Truck shipments of corn, wheat, oats and soybeans are shown in the tables and charts. Sixty percent of the truck shipments went out-of-State. Feed received at Indiana country elevators by truck traveled a shorter distance than corn and oats.

495. FARRIS, P. L., and STOREY, D. A. Truck shipments of grain from Indiana elevators. Ind. Agr. Expt. Sta. Mimeo. EC-184, 44 p.,tables. Aug.1959. 100 In2Ag
Rail shipments of corn, oats, wheat, and soybeans decreased, and truck shipments increased during the year. Maps and tables show the destinations of trucked grain, type of truck haul used for out-of-State shipments, trucking charges, and origins of corn and oats trucked into Indiana country elevators.

496. FINNIE, D. N. Bulk transportation and pneumatic handling of flour. Assoc. Oper. Millers. B. 1948:1712-1717. 298.9 As7
Describes the system devised by the National Fitch Corporation, and the two types of railroad cars designed for use in these experiments.

497. FISCHER, J. Conveying flour by air. 1-2. Food Processing 20(9):37,39,43. Sept.1959; 20(10):39. Oct.1959. 389.8 F7325
Advantages of pneumatic handling are savings in cost of flour (over that in sacks), savings in storage area, cleanliness, safety in operation, and ease in automatic handling. These apply to both truck and rail shipments in bulk.

498. FOSTER, R. O., and HALDEMAN, R. C. Grain transportation on the St. Lawrence Seaway. U. S. Agr. Mktg. Serv. Mktg. & Transportation Situation MTS-137:30-34. Apr.1960. 1.941 M8M34
Examines the impact of the Seaway on the United States grain export traffic and considers the outlook for the 1960 season.

499. GLEASON, J. M. Bulk handling, loading and transportation. Amer. Miller & Processor 86(7):18-20,46. July 1958. 298.8 Am32
Deals with flour and semolina, and problems such as condensation experienced during bulk loading. Presented at 62nd Annual Association of Operative Millers Technical Conference on May 8, 1958.
Also in Assoc. Oper. Millers. B. Oct.1958. p.2402-2404. 298.9 As7

500. GOLDBERG, R. A. The soybean industry, with special reference to the competitive position of the Minnesota producer and processor. Minneapolis, U. Minn. Press, 1952. 186 p., Ref. 281.360 G56
Contains a discussion of the competitive position of the processor as affected by transportation, p. 89-125. Six important factors are listed, and an analysis is made of each as it affects Minnesota's position in the industry.

501. HALDEMAN, R. C. Changes in grain transportation and their effects on marketing. U. S. Agr. Mktg. Serv. AMS-388:204-211. July 1960. A280.39 M34Am
Paper presented at the National Marketing Service Workshop at West Lafayette, Ind., November 17-19, 1959. Considers changes in rail, barge, and truck transport, freight rates, the St. Lawrence Seaway, and forecasts reductions in railroad rates.

502. HALDEMAN, R. C. Competition in grain transportation. Nowest. Miller 263(10):19-23. Mar.1960. 298.8 N81
A discussion of shipping rates by barge, truck, rail, seaway and ship, and their impact on volume of traffic, on grain elevators, and on markets.

503. HALDEMAN, R. C. Potential effects of St. Lawrence Seaway on costs of transporting grain. U. S. D. A. Mktg. Res. Rpt. 319,149 p., illus. Ref. 1959. 1 Ag84Mr
A study of movements of grain from 17 States to interior and port destinations, export grain movements, potential export volume via the Seaway, physical limitations of the waterway, seaway tolls, grain handling expenses, transportation costs and charges for motortrucks, railroads, inland waterway, Great Lakes and ocean transportation.

504. HALDEMAN, R. C. Shifts in grain transportation patterns. Agr. Mktg. 5(1):14-15. Jan.1960. A280.38 Ag8
From production areas of the Midwest, more grain is moving to market by motortruck, by barge, and by Seaway.

505. HARTLEY, J. R. The effects of the St. Lawrence Seaway on grain movements. Indiana. U. Sch. Business. Bur. Business Res. Ind. Business Rpt. 24,252 p. Ref. 1957. 280.9 In27I
Contents: 1, The structure of the world grain trade - today and tomorrow; 2, The nature of the Seaway project; 3, General factors affecting Seaway grain rates and shipping service; 4, Can large grain vessels operate at Seaway drafts?; 5, Feasible rates for grain via the waterway; 6, Grain territory tributary to the Seaway; 7, Cost advantage of the Seaway for grain movement; 8, Potential changes in grain movement; 9, Impact, total and specific.
Also in condensed form in Amer. Mktg. Assoc. Proc. Winter Conf. 1956:230-233. 1957. 280.39 Am35P

506. HAWES, F. W. This new ventilation system keeps car dry in transit, thus providing air conditioned bulk flour delivery. Bakers Digest 33(4):63-65. Aug.1959. 389.8 Si1
Describes a new filtered air ventilator which can be applied either to Airslide cars, bulk flour trailers, or barges, to solve the problems that occur during transportation of bulk flour.

507. HEARD, H. C. Bulk delivery of poultry feeds. Amer. Coop. 23:317-324. 1951. 280.29 Am3A
Bulk delivery trucks, equipment for loading and elevating, and savings from this system are discussed.

508. HEDLUND, E. C. The transportation economics of the soybean processing industry. Urbana, U. Ill. Press, 1952. 189 p. Ref. (Illinois Studies in the Social Sciences, v. 33, No. 1). 289.22 H35
Partial contents: Ch. 5, General considerations of the transit privilege; Ch. 6, Processing of soybeans in transit; Ch. 7, The economic effects of transit; Ch. 8, The general railroad rate structure; Ch. 9, The railroad rate structure for soybeans and soybean products; Ch. 11, Summary and conclusions.

509. HERMAN, R. S. The applications of bulk flour handling. Bakers' Wk. 164(1):39-46. Oct.4,1954. 389.8 B172
Address before the Southern Bakers Association in Atlanta, Ga., September 28, 1954.
Portable bins made of wood, and of aluminum, four different types

of bulk railway cars, some bulk trucks, diversity in unloading systems, and operating costs are discussed.
Also in Amer. Miller & Processor 82(11):26-28,30,32,34,36,38-39. Nov.1954. 298.8 Am32; Mod. Miller & Bakers News 81(21):25-30, Oct.9,1954. 298.8 M72

510. HOSKINS, W. G. Railroad cars "for flour only." Macaroni J. 35(12):16-18. Apr.1954. 298.8 N46
Bulk handling and benefits from it are discussed. It is said to save 17 cents per hundredweight in shipping flour.

511. HUDSON, W. J. A study of conditions affecting the transportation of grain by railroad. Washington, U. S. Prod. & Mktg. Admin. Mktg. & Facilities Res. Br., 1953. 56 p. 1.956 M343St92
Some of the factors considered are volume, commodity distribution, seasonal and regional distribution, effects of production on demand for grain transport, surpluses, storage facilities, and boxcar supply and utilization.

512. HUDSON, W. J., and HENSCHEN, E. K. The transportation and handling of grain by motortruck in the Southwest. U. S. Agr. Mktg. Serv. AMS-175,65 p.,illus. May 1952. A280.39 M34Am
Originally issued by the U. S. Production and Marketing Administration, Marketing and Facilities Research Branch. 1.956 M343T68
A study of the extent of diversion of traffic from rail to motor carriers and reasons for it, the nature of trucking operations and appraisal of equipment, service and cost advantages and disadvantages of moving by truck, and grain-handling equipment for loading and unloading grain from trucks and boxcars.

513. JAMISON, L. R. Modern developments in sanitary transportation of grain and flour. Bakers' Wk. 156(5):83-88,illus. Nov.1952. 389.8 B172
Discusses sanitation of boxcars, collapsible rubber containers, experimental work with a standard covered hopper car, with tote boxes, the Trans-Flo car, the Flexabin, and l. c. l. containers.

514. JAY, J. E., and ENGER, M. R. Railroad transportation of rough rice in Louisiana and Texas; a study of facilities and equipment. U. S. D. A. Mktg. Res. Rpt. 136,15 p. Sept.1956. 1 Ag84Mr
Compares the time and labor required by various methods to load and unload carloads of rough rice, and shows the increases in bulk storage capacity in recent years. Costs are shown for unloading sacked and bulk rice in boxcars. Bulk shipments can contribute to improved car utilization by reducing car detention and turnaround time.

515. KIRBY, J. F. A time study of how boxcars roll. Co-op Grain Q. 15(4):61-62. Mar.1958. 280.28 C7898
A study by the U. S. Agricultural Marketing Service in conjunction with several western grain hauling railroads. Time studies were made of each of the principal steps in the grain transportation operation. Two markets were observed, Enid, Okla., and Wichita, Kans.

516. KOLLMAN, W. Dollar savings of bulk flour handling versus conventional handling. Amer. Soc. Bakery Engin. Proc. 33:97-104. 1957. 389.9 Am37P
Tables show costs when using portable bins, tank trucks, and tank cars.

517. LESSING, C. J. Postwar grain freight rates - a fantastic structure. Nowest. Miller 263(10):10, 12-16. Mar.8, 1960. 298.8 N81

In a speech before the Industries Forum at the University of Illinois, the speaker explains the reasons for the complex and "piece-meal" changes in rail freight rates, with illustrations from specific cases, and suggested remedies.

518. LIMMER, E., and BYRNE, R. J. Transportation of rice in the South; an economic survey. U. S. D. A. Mktg. Res. Rpt. 140, 51 p. Nov.1956. 1 Ag84Mr

Includes 32 tables.

A study of methods of transporting rice, advantages and disadvantages of railroad, truck, and water transport, rates and rate structures, distances of movements of dried rough and milled rice, containers used for shipping, improvement in loading and unloading methods, reasons for favoring and for opposing the use of hopper cars, and cleaning and recoopering of boxcars by rice shippers.

519. MCGLOTHLIN, R. S. Hay and feed grains in the West; supplies, utilization, and interstate movement. Ariz. Agr. Expt. Sta. B. 289, 38 p., maps, charts. Nov.1957. 100 Ar4

A Western Regional Research Project.

Hay movements, p. 15-18; Grain movements, p. 22-32.

520. MALPHRUS, L. D. Local grain prices and freight rates. S. C. Agr. Expt. Sta. C. 74, 12 p. Aug.1949. 100 So8

Topics covered are: Types of freight rates; The transit privilege and how it works; Influence of transit privilege on price of grain; and Comparison of freight rates on grains and livestock.

521. MANION, W. M., and ANDERSON, C. M. Flaxseed marketing practices and costs at country elevators. U. S. D. A. Mktg. Res. Rpt. 301, 47 p., maps. Feb.1959. 1 Ag84Mr

Transportation from country elevators, p. 30-38, shows the percentage and quantity of flaxseed shipped by truck and by rail from country elevators in North Dakota, South Dakota, and Minnesota in 1955-56, freight rates per bushel by rail and by truck, and economic reasons given by managers for rail shipping and for truck shipping.

522. MARTIN, L. R., and others. Grain marketing problems in the South. I. Changing role of grain production in the South. South. Coop. Ser. B. 60, 103 p., map, tables. Fayetteville, Ark., 1959. 100 G29So

W. R. Morrison, C. A. Moore, T. D. Aaron, C. M. Wells, and J. C. Winter, joint authors.

Agricultural Experiment Stations of Arkansas, Georgia, Mississippi, North Carolina, Texas, and the U. S. Agricultural Marketing Service and U. S. Farmer Cooperative Service, cooperating.

Sect. VI, Transportation as a factor in grain marketing in the South, p. 63-78.

Discusses characteristics of rail movements of grain by water in the South, and freight rates on grain in the South. Also considers amounts of grain moved by barge on the Mississippi and Tennessee Rivers.

523. MUENZ, L. Barging in on Old Man River. Co-op Grain Q. 17(3):46-54, illus. Aug.1959. 280.28 C7898

Grain shipping on the Mississippi River system, including the Illinois, Missouri, and Ohio Rivers, is steadily increasing. A map shows location of grain terminals on the Mississippi River system. Tonnages of transport to and from eight principal inland ports are given. Size, costs, speed, cargo, traffic loading, and characteristics of river tugboats and barges are described and illustrated. A table on p. 52 shows typical barge shipping costs between river ports for wheat, soybeans, corn and barley.

524. PFENING, F. D. New developments in flour handling. Bakers' Wk. 157(6):29-32,38-39. Feb.1953. 389.8 B172
Comments on bulk handling of flour by tote bin, by bulk trailer, and by bulk car. Also discusses experimental bulk containers, such as a fiberboard collapsible container, synthetic rubber bags holding 3,000 pounds, and the l. c. l. containers used by railroads. The advantages of pneumatic handling are set forth, but each system is custom-planned and custom-made.

525. POATS, F. J. Transportation in marketing molasses for feed. U. S. D. A. Mktg. Res. Rpt. 149,28 p. Jan.1957. 1 Ag84Mr
A study of the transportation of molasses from the producer to the user, with particular attention to the methods, practices, and costs of three types of bulk transport (trucks, railroads, and waterborne carriers) between seaport terminal or mainland producer and consumer.

526. RICKEY, L. F. The bulk delivery of feed. Amer. Miller & Processor 82(12):50,52-53. Dec.1954. 298.8 Am32
A summary of the history, development, trends and problems related to the bulk transport and delivery of feed - reported in November at the Ohio Nutrition Conference in Columbus.
Gives costs of handling bulk feed, time consumed in loading the truck, and advantages of the system.

527. RICKEY, L. F. Delivering feed in bulk; methods, equipment, costs and operating problems. U. S. Farmer Coop. Serv. C. 3,30 p., illus. Apr.1954. A280.29 F22F
Originally published by the U. S. Farm Credit Administration as Circular C-143 in January 1952. 166.2 C4923
On the development of bulk delivery, its advantages and disadvantages. Describes the equipment and methods used at ten selected feed mills. Convenience and labor saved were the factors that determined the preference of farmers for bulk delivery.
Also in Feedstuffs 24(14):33-34,36-38,42,44,46,48-52,54-58,60-64. Apr.5,1952. 286.81 F322

528. RICKEY, L. F. Feed bags; kinds, costs and problems. U. S. Farmer Coop. Serv. C. 2,21 p.,illus. Apr.1954. A280.29 F22F
Advantages and disadvantages of burlap, cotton, and paper bags are considered. Sterilizing, assembling, and reconditioning used bags, comparative cost of new and used bags, and bags vs. bulk delivery, are discussed.

529. ROBERTS, M. Economic aspects of southern grain rates. South. Econ. J. 16(1):44-52. July 1949. 280.8 So84
Equality of rates on grain and grain products, extensive granting of transit privileges, the high level of rates prevailing in the South resulting from that region as a deficit area in grain production, alternative rates or gateway equalization of rates, an extremely

complicated rate adjustment, and the relatively small spread between the carload and less than carload rates on grain in that area are discussed.

530. ROGERS, G. B., and WOODWORTH, H. C. Distributing and handling grain-feeds in New Hampshire. I-III. N. H. Agr. Expt. Sta. B. 426,28 p. July 1956; 427,29 p. July 1956; 431,42 p. Aug.1956. 100 N45
Assembly, milling, and distributing to retail outlets, p. 9-16, appears in Part I. It includes milling-in-transit privileges.
Achieving delivery route efficiency, p. 20-49, is in Part II.

531. SAVAGE, J. Transportation fishy back. News Farmer Coop. 25(5):8-9. Aug.1958. 166.2 N47
Brief description of trailerships as a superior method of transportation for the Louisiana Rice Growers at Crowley, La.

532. SCHUMAIER, C. P. Illinois grain production and trade. Ill. Agr. Expt. Sta. B. 637,104 p.,tables. Feb.1959. 100 IL6S
Grain transportation, p. 60-85, covers transit rates by rail, truck, and barge, and trends in grain transportation. Concludes that the rise in rail freight rates will continue to put a premium on processing close to the source of raw material and on developing truck-barge transportation of grain.

533. SCHUMAIER, C. P. Truck shipment of grain in Illinois, 1956. Ill. U. Col. Agr. Dept. Agr. Econ. Res. Rpt. AERR 25,23 p.,tables. Aug.1958. 281.9 IL62
Shows division of truck shipments between in-State and out-of-State shipments, by areas and by grains, destinations of out-of-State shipments, trends in truck transportation, costs, practicability, and convenience. The grains were corn, oats, wheat, and soybeans.

534. SCHUMAIER, C. P. Truck shipment of grain in Illinois,1957. Ill. U. Col. Agr. Dept. Agr. Econ. Res. Rpt. AERR-29,18 p.,tables. Dec.1959. 281 IL62
Discussion of the volume of grain purchased, the disposition of grain, by method of transportation, the division of truck shipments between in-State and out-of-State shipments, and the destination of out-of-State truck shipments for corn, oats, wheat, and soybeans.

535. SCHUMAIER, C. P., and AHRENS, C. L. Truck shipments of grain in the North Central Region, 1956. Ill. U. Col. Agr. Dept. Agr. Econ. AE-3503,33 p.,tables. Mar.1960. 275.29 IL62P
The appendix contains statistics for each of 11 States, showing total elevator purchases, total truck shipments and destinations of out-of-State shipments, by crop reporting districts, by grains, 1956. About one fourth of the grain purchased by country elevators was trucked to first destinations.

536. SCHUMAIER, C. P. Truck shipments of grain in the North Central region, 1957-58. Urbana, Ill. U. Col. Agr. Dept. Agr. Econ., [1960]. 51 p.,maps,tables. Private file
Partial contents: Disposition of elevator purchases for 1956 crop year; Methods used for grain shipments, by States and by grains, 1957; Destinations of out-of-State truck shipments; Average trucking charges for grain; Trends in truck shipment of grain in the North Central Region. The appendix contains 33 pages of tables and maps. The grains covered are corn, oats, wheat, soybeans, barley, sorghum, rye, and flax.

537. SCOTT, W., and others. Grain freight rates, with emphasis on grain originating in Kansas. Kans. Agr. Expt. Sta. C. 280,23 p. Dec.1951. 100 K13S
J. H. McCoy, S. Masters, and J. S. Chartrand, joint authors.
Selected rates are shown in tables, with discussion of freight rate structures, rates between given points and transit conditions.

538. SEAGRAVES, J. A. Bulk feed handling reduces labor costs. N. C. State Col. Agr. & Engin. Dept. Agr. Econ. A. E. Inform. Ser. 68,27 p. Nov.1958. 281.9 N816
Savings in delivery to farms with bulk trucks rather than bagged trucks are estimated at 15 cents per ton. Farm savings are estimated at 6 to 10 cents. Bulk handling eliminated a great deal of physical strain.

539. SMITH, E. B. The milling industry's transportation problems; an analysis of problems vital to the prudent purchase and sales of wheat and flour, selection of method and routing, location and nature of plant facilities. Nowest. Miller 259(17):12-14,16-21. Apr.29,1958. 298.8 N81
Text of a speech before the Millers National Federation called Transportation revolution. This is described as the large-scale movement of wheat by trucks, the movement of wheat and flour by barge on the interior waterways, the development of Airslide bulk cars and trucks, and the problems created by these changes.
Also in Amer. Miller & Processor 86(8):20-22,24,37; (9):40-42, 44-45. Aug.-Sept.1958. 298.8 Am32

540. SORENSON, V. L., and HALL, C. W. Efficiency in distribution of mixed feeds; a study of bulk handling costs. Mich. Agr. Expt. Sta. Q. B. 38(3):460-470. Feb.1956. 100 M58S
Considers labor costs of loading feed at the plant, labor costs of farm delivery of bulk feed, and truck costs.

541. STENGER, A. Developments on the bulk feed front. Feeds Illus. 8(11):33,36-38,40. Nov.1957. 389.78 F326
Many larger feeders and growers are demanding delivery of feeds in bulk form, and bulk handling has been accelerated. Many manufacturers have not wanted to promote the handling of their feeds in bulk because of a possible loss of brand identity. Discusses tanks, hoppers, farm storage, and cost of installation.

542. TALMEY, P. Bulk transportation and handling of flour and semolina. Macaroni J. 33(12):48-49,88. Apr.1952. 298.8 N46
Advantages of bulk flour handling that are stressed are: It is sanitary, transportation equipment is under control of the user and is available for his use only, and it provides very sizable savings in both material and labor costs.

543. TALMEY, P. This simple, yet rugged, freight car is one reason why bulk handling [of flour] is proving practical. Bakers' Helper 96(1205):45-47. Sept.29,1951. 389.8 B17
On problems to be solved, mechanics involved, economics, shrinkage, cost of bulk storage, tote system, and maturing of flour.

544. TAYLOR, F. R., and NELSON, D. C. Truck shipment of grain by North Dakota elevators, 1956-57. N. Dak. Agr. Expt. Sta. Agr. Econ. Rpt. 14,24 p.,tables. May 1959. A281.9 N814A

The volume of grain shipped by truck from country elevators has increased significantly since World War II. Study shows the amount of grain shipped to first destinations by truck, in-State and out-of-State shipments, and origin of grains by crop-reporting districts. Grains included in study are corn, oats, barley, rye, wheat, soybeans, and flax.

545. TAYLOR, F. R., and NELSON, D. C. Truck shipment of grain by North Dakota elevators 1957-58. N. Dak. Agr. Expt. Sta. Agr. Econ. Rpt. 15,28 p. Aug.1959. 281.9 N814A
This second report is similar to the first.

546. TAYLOR, F. R., and NELSON, D. C. Truck shipment of grain from North Dakota elevators, 1958-59. N. Dak. Agr. Expt. Sta. Agr. Econ. Rpt. 17,23 p.,tables. May 1960. 281.9 N814A
This third report is similar to the first and second.

547. TICKNOR, B. H. How molasses moves to feedmen. East. Feed Merchant 3(3):24-25,79-80. Mar.1952. 389.78 Ea7
Modern transportation terminals expedite the use of blackstrap molasses in feed. This is a story of the imported molasses handled from tankers to storage tanks, and delivered by tank cars and tank trucks. The tank truck reaches stores and warehouses where frequently no rail facilities exist.

548. U. S. TENNESSEE VALLEY AUTHORITY. NAVIGATION AND TRANSPORTATION BR. The Barge grain case - its significance to the Tennessee Valley and the Southeast. Knoxville, Tenn., 1951. 38 p.,maps,tables. Private file
The object of the case was to reduce rail rates on grain when they were part of a combined movement by barge and rail. The lowered freight costs would lead to lower prices on grain and feeds and encourage a shift from growing soil-depleting crops to the soil-building enterprise of raising livestock. Legal basis of the bargeline complaint is given and proposed revision in rates is shown.
The Supreme Court ruling prohibits any railroad rate-making device that deprives shippers of any of the savings of barge transportation.

Livestock and Livestock Products

549. ABDOU, A. A. Economic aspects of motor transportation in marketing livestock. J. Farm Econ. 39(4):958-965. Nov.1957. 280.8 J822
Discusses the reasons for diversion of traffic from rails to trucks, comments on the various rate and service factors involved, and suggests methods of reducing the livestock trucking bill.

550. BREAKIRON, P. L. Loss and damage in rail transportation of dressed beef. U. S. Prod. & Mktg. Admin. Mktg. & Facilities Br., 1952. 26 p. 1.956 M343L892
Describes methods of loading and shipping beef, extent and importance of loss and damage, damage in relation to grade, to hook location, to condition of refrigerator cars, and to shock and vibration during transit.

551. COLE, T. W. Maintaining the health of livestock in transit. U. S. D. A. L. 38, rev., 8 p. Jan.1953. 1 Ag84L

Care and handling, feeding, watering, protection against cold in freight cars, and requirements of the 28-Hour Law are considered.

552. CONYERS, L. N., and BYRNE, R. J. North Dakota cooperatives coordinate transportation for economy and service. U. S. Farm Credit Admin. Coop. Res. & Ser. Div. Misc. Rpt. 132,53 p. June 1949. 166.3 M68

Progress of the Farmers Union Federated Cooperative Shipping Association of Minot, N. Dak., in serving its patrons. A case history of a cooperative which has developed an efficient and dependable transportation service for its farmer patrons with up-to-date equipment and competent personnel. Discusses services rendered, savings in costs and in time in transit, payments for livestock killed or injured in transit, and personalized services given to its patrons.

553. DREESEN, W. H. Transportation rates on livestock and meat products in Western States. Oreg. Agr. Expt. Sta. B. 496,40 p. Mar. 1951. 100 Or3

Freight rates are shown in 24 tables, between western cities and midwestern and southern markets. The appendix includes a table showing charges for services of icing and re-icing.

554. FOWLER, S. H. The marketing of livestock and meat. Danville, Ill., Interstate, 1957. 622 p. 280.340 F82

Transportation of livestock, p. 387-415, gives a general picture of water, rail, and truck transport, with comments on competition, costs, and freight rates.

555. GERRITY, M. V., and JOHNSON, H. D. Motortruck transportation of freshly killed beef. U. S. D. A. Mktg. Res. Rpt. 119,40 p., illus.,tables. June 1956. 1 Ag84Mr

Tests were made with 12 motortruck trailers, equipped with various types of mechanical refrigerating units, to compare different methods of circulating the cold air around and through the load. Comparisons also were made of meat-hanging rails of two designs.

556. GOLTZ, G. A novel military refrigerated truck. Refrig. Engin. 56(6):500-502,548. Dec.1948. 295.9 Am32J

Developed for the use of the military forces for conveying freshly slaughtered meat to the processing stations.

557. GUILFOY, R. F. Tests of a sprinkler system for hot-weather hauling of live hogs in truck-trailers; an interim report. U. S. D. A. Mktg. Res. Rpt. 172,20 p.,illus. May 1957. 1 Ag84Mr

Describes a simple, inexpensive water sprinkler system for cooling animals in transit and gives costs and methods used in testing. Tables show transit shrink in sprinkled and unsprinkled trucks. Results indicated the spray cooling of hogs in transit reduced death losses and transit shrink and increased yields of meat.

558. HASSLER, J. B. Strategic factor—transportation costs influence competition in livestock industry. West. Livestock J. 33(13): 107-109,111. Feb.1,1955. 6 F2278

Deals with the grain-to-livestock transportation ratio and the ratio of transportation costs on live animals to fresh meat, with reference to the swine and beef cattle industry.

559. HASSLER, J. B. Transportation rates and other pricing factors affecting the California swine industry. Calif. Agr. Expt. Sta. B. 754,36 p. June 1956. 100 C12S
The two major issues dealt with are: (1) The relationships and implications to local industry of absolute and relative transportation costs on live hogs and pork products for shipments to California from midwestern points of supply; and (2) how efficiently the pricing system has been operating in conjunction with the given rate structures of the past.

560. HINDS, R. H., and GUILFOY, R. F. Sprinkling hogs in trucks to reduce losses from heat. U. S. D. A. Mktg. Res. Rpt. 374,44 p., illus. Nov.1959. 1 Ag84Mr
Supersedes Marketing Research Report 172, entitled Tests of a sprinkler system for hot-weather hauling of live hogs in truck-trailers, by R. F. Guilfoy, dated May 1957.
All of the sprinkling systems designed and used during the three years of tests proved satisfactory. Substantial savings resulted from lower mortality, less transit shrink, and higher dressing yields.

561. HUBBERT, F. A comparison of trucking and trailing beef cows and calves to and from summer range. J. Anim. Sci. 14(1):279-286. Feb.1955. 49 J82
Trucking the animals 40 miles in Oregon had no advantage following a summer of poor grazing conditions, but had a significant advantage in weights of stock following a good summer grazing season.

562. JENKINS, S. L., MAROUSEK, G. E., and BRISCOE, N. A. Livestock marketing practices and preferences in northeastern Oklahoma, 1957. Okla. Agr. Expt. Sta. Processed Ser. P-307,73 p., map. Nov.1958. 100 Ok4M
Transportation, p. 37-41, covers methods of transportation used by farmers when selling and purchasing livestock, and distances from markets.

563. JOHNSON, H. D., PENNEY, R. W., and GUILFOY, R. F. Rail car and "piggyback" transportation of freshly killed beef. U. S. D. A. Mktg. Res. Rpt. 339,32 p., illus, tables. June 1959. 1 Ag84Mr
The relative performances of mechanically refrigerated rail cars and trailer-on-flatcar equipment in the transportation of carcass beef were compared with a standard ice-bunker car commonly used in this service. The water-ice car showed greatest fluctuations in temperature.

564. JOHNSON, H. D., and GERRITY, M. V. Tests of one system of dry ice refrigeration in the transportation of meat by motortruck-trailer; an interim report. Washington, U. S. Prod. & Mktg. Admin. Mktg. & Facilities Res. Br., 1953. 20 p. 1.956 M434T284
Detailed temperature records were kept during transit tests of chilled beef and frozen pork, and consumption rate and cost of dry ice was recorded.

565. JOHNSON, H. D., GERRITY, M. V., and GARVER, C. E. Transportation tests of fresh meat and packinghouse products in refrigerator cars; an interim report. U. S. Agr. Mktg. Serv. AMS-17,67 p. Mar.1955. A280.39 M34Am
Includes 27 tables and 26 charts.

The different types of icing services used water ice, water ice with various percentages of salt added, water ice plus salt and dry ice, and water ice plus salt in fan cars.

566. JONES, A. D. Wool warehouses and their operation in the eleven Western States. N. Mex. Agr. Expt. Sta. B. 440,59 p.,map. June 1959. 100 N465
Transportation to warehouse, p. 30-31; Principal outlets and modes of transportation, p. 51-53. Table 16 shows wool handled by truck, rail, and ship, in 1957 for handlers, dealers, and handler-dealers.

567. LIMMER, E. Index numbers of railroad freight rates on livestock and meats, 1940-50. Washington, U. S. Bur. Agr. Econ., 1951. 19 p. 1.941 M2In22
Index numbers are given by major types, major areas, by species and area, by origins and destination. Weights used in computing rate indexes by classes of livestock, and basic rates on livestock according to mileage blocks and by major areas are also given.

568. LIVESTOCK CONSERVATION. Annual report, 1950-51. Chicago,1952? 24 p.,illus. 280.3409 L75
Contains illustrations and charts designed to campaign for the elimination of livestock crippling, bruising, and deaths during shipment, with brief text.

569. MCPHERSON, W. K. Freight rates vary on dressed vs. live beef. Fla. Cattleman 19(11):26,28-29. Aug.1955. 43.8 F66
The relationship between live animal and beef carcass freight rates either penalizes Florida packers who buy live animals on Midwest markets, or depresses the price of high grade slaughter cattle in the State.

570. NEWBERG, R. R. Livestock marketing in the North Central Region. I. Where farmers and ranchers buy and sell. Ohio. Agr. Expt. Sta. Res. B. 846,188 p.,maps. Dec.1959. 100 Oh3S
This is also North Central Regional Publication 104.
Transportation of livestock, p. 75-86, shows methods of hauling, and distance hauled, in the eastern and western parts of the region.

571. PHILLIPS, V. B. Hired truck transportation in marketing livestock. U. S. D. A. Mktg. Res. Rpt. 297,16 p. Dec.1958. 1 Ag84Mr
Deals only with services used by livestock producers in the year 1955. It shows the average length of haul and the cost per head of transporting cattle, hogs, sheep, and lambs by markets and regions.

572. PINGREY, H. B. Marketing western range sheep and lambs. N. Mex. Agr. Expt. Sta. B. 434,61 p.,maps. Apr.1959. 100 N465
Transportation: Delivery point, methods and costs, p. 41-47.
Table 14 shows methods of transporting western range lambs to delivery point for specific Western States in 1955. The cost of marketing lambs varied between certain points due to method of sale, distance to market, and method of transportation.

573. RANSOM, R. W. Says mechanically refrigerated freight cars offer answer to problems of shipping meats. Indus. Refrig. 128(6):26-31,56. June 1955. 295.8 Ic2
Construction, motive power, insulation, equipment, and experience of J. Morrell and Company in using these cars.

574. RICKENBACKER, J. E. Causes of losses in trucking livestock. U. S. D. A. Mktg. Res. Rpt. 261,21 p. June 1958. 1 Ag84Mr
Conditions and practices having a relationship to injury and death of animals in transit included type and quantity of bedding used in truck, number of animals in the load and their positioning in the vehicle, adequacy of ventilation, use of partitions, horned animals included with others, endgates, and practices of drivers in handling animals during unloading.

575. RICKENBACKER, J. E. Handling conditions and practices causing bruises in cattle. U. S. D. A. Mktg. Res. Rpt. 346,46 p. Aug.1959. 1 Ag84Mr
The largest number of bruises occurred during the movement from packer holding pens through slaughter. Causes of carcass injury in all handling phases were: (1) Animal characteristics; (2) facilities involved in transporting and handling animals; (3) handling techniques; (4) actions and attitudes of personnel actually moving or handling the cattle; and (5) such miscellaneous factors as weather condition, and length-of-haul.

576. RICKENBACKER, J. E. Losses of livestock in transit among Wisconsin cooperatives. U. S. Farmer Coop. Serv. Serv. Rpt. 11, 21 p.,charts. Feb.1955. A280.29 F22
A pilot study of three markets. Factors causing crippling and killing were long hauls, unfavorable weather, faulty loading facilities, and careless handling while on the road. Suggests an educational program emphasizing precautions the producer, trucker, and marketer can take to prevent losses.

577. RICKENBACKER, J. E. Losses of livestock in transit in Midwestern and Western States. U. S. D. A. Mktg. Res. Rpt. 247, 40 p. June 1958. 1 Ag84Mr
A study of the relationship of length-of-haul and seasonal weather conditions to bruising, crippling, and killing of livestock received at ten major markets by truck and by rail in 1954-55.

578. RILEY, H. M., WILSON, C. P., and GORTON, J. The use of the feed-in-transit privilege in the marketing of cattle and sheep in Kansas. Kans. Agr. Expt. Sta. C. 288,13 p. June 1952. 100 K13S
Describes the functioning of the privilege, the extent to which it is used by Kansas farmers, and some of the factors affecting its use.

579. ROBERTS, N. K. Those shrinkage costs in lamb marketing. Utah. Agr. Expt. Sta. C. 141,14 p. 1959. 100 Ut1
Actual shrink by rail and truck for both fat and feeder lambs was measured. Mode of transportation had little effect on the rate of shrink, but time in transit was the major determining factor.

580. ROBERTS, N. K., and GROVER, L. H. Transporting Utah cattle by truck. Utah. Agr. Expt. Sta. B. 417,25 p. Nov.1959. 100 Ut1
Partial contents: Cattle truck operating costs; truck rates for hauling cattle; truck ownership vs. truck hiring; factors influencing truck operating costs; factors related to trucking rates.

581. SCHNEIDER, E. Pattern of distribution of livestock, meat, and products shipped by railroad, 1939, 1948, and 1949, and transportation charges, 1948 and 1949. Washington, U. S. Bur. Agr. Econ., 1951. 25 p. 1.941 M2P272

Data show shipments by commodity for States and regions of origin and destination, and average revenues.

582. THOMPSON, W. H. Postwar railroad rate increases on livestock and products. Ill. U. Cur. Econ. Comment 19(2):47-60. May 1957. Internatl. Coop. Admin. Libr.
Examines the rate increases between the years 1946 and 1956 on the movement of livestock and dressed meats from 16 selected midwestern origins to three common destinations. Analyzes the effects of these rate advances on the rate relationships.

583. U. S. AGRICULTURAL MARKETING SERV. Direct shipments into selected North Central States by State of origin, cattle and calves, sheep and lambs, 1941-1957. U. S. D. A. Statis. B. 242,20 p. Jan. 1959. 1 Ag84St
Consists entirely of tables.
Direct shipments include stockers and feeders coming from points other than public stockyards into Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, South Dakota, and Nebraska.

584. U. S. AGRICULTURAL MARKETING SERV. Interstate movement of dairy cattle 11 Northeastern States, 1952-53. Washington, 1954. 9 p. 1.941 M1St2
Tables show inshipments and outshipments by source and by destination.

585. U. S. AGRICULTURAL MARKETING SERV. Livestock and meat statistics 1957. U. S. D. A. Statis. B. 230,307 p.,tables. July 1958. 1 Ag84St
A section on livestock movements, p. 50-98, contains tables showing receipts and shipments of stocker and feeder cattle and calves, sheep and lambs, and hogs, by markets and dates, by class and weight. Some statistics are for 1940-1957 and some 1922-1956.

586. U. S. BUR. OF AGRICULTURAL ECONOMICS. Interstate movement of dairy cattle 11 Northeastern States, 1951. Washington, 1952. 9 p. 1.941 M1St2
Data show inshipments and outshipments by source and by destination.

587. WEBB, T. F. Improved facilities for washing and disinfecting livestock trucks. U. S. Agr. Mktg. Serv. AMS-375,12 p. Apr.1960. A280.39 M34Am
Data and guidelines for use in designing an efficient facility for washing trucks to minimize the spread of livestock diseases.

588. WILKINSON, E. How to load and transport horses. Cattleman 36(4):114-115,illus. Sept.1949. 49 C29
Gives specific instructions with twelve illustrations for easiest and safest methods.

Poultry and Poultry Products

589. ARNOLD, J. S. Least-cost sites for cooperative egg marketing federations for eastern South Dakota. S. Dak. Agr. Expt. Sta. Agr. Econ. Pam. 109,68 p. Ref. Aug.1960. 281.9 So86
Includes cost data for trucks and labor, routes for collection, trip loads, and density factors.

590. BENJAMIN, E. W., and others. Marketing poultry products. Ed. 5. New York, Wiley, 1960. 327 p. Ref. 280.347 B43M
J. M. Gwin, F. L. Faber, and W. D. Termohlen, joint authors.
Ch. 11, Transporting and storing eggs and poultry, contains tables showing receipts in pounds of eggs, processed poultry, and processed turkeys for the major markets of the United States. It also summarizes refrigeration in transit and rates and regulations.

591. BISHOP, R. W. Large scale shipments of baby chicks by air. World's Poultry Cong. Rpt. Proc. 10(sect. D):287-289. 1954. 47.9 W89910
How shipments to foreign countries should be packed, and exact timing of arrival be determined so the chicks may be fed and watered within 72 hours.

592. BRADFORD, H. W., RATCLIFFE, H. E., and SCANLAN, J. J. Cost of handling eggs of selected cooperatives in the North Central States. U. S. Farm Credit Admin. Misc. Rpt. 162,47 p.,tables. May 1952. 166.3 M68
Egg-handling activities were broken down into 13 operations which included collecting, receiving, stacking, loading out, and delivering. Labor costs, direct and indirect, and truck and other costs are shown in tables. The collecting or hauling to plant is divided into loading truck with empty cases, driving truck, loading truck at farm, making out producer records, and unloading at plant.

593. CRAY, R. E. The efficiency and costs of collecting eggs from farms in Ohio. Ohio. Agr. Expt. Sta. Res. B. 721,19 p.,illus. June 1952. 100 Oh3S
Studied the comparative efficieney of assembling eggs on farm pick-up truck routes in a densely poultry populated area and a sparsely poultry populated area, on pickup trucks in summer and in winter on the same route, costs per case and per mile, and the importance of labor and truck operating costs per mile in collecting eggs at the farm.

594. EARLE, W. Time and travel requirements in country egg receiving stations. Cornell U. Col. Agr. Dept. Agr. Econ. A. E. 741, 31 p. July 1950. 281.9 C81
An analysis of the operations at an egg receiving station, involving the loading of pickup trucks, description of truck routes, unloading of truck at receiving station, and loading transport truck with full egg cases. Tables show the minutes used in each of many operations in the time study.

595. FISCHER, C. M. Studies in turkey marketing in the Western States. Utah. Agr. Expt. Sta. Spec. Rpt. 6,16 p.,illus. May 1952. 100 Ut1Sp
A Western Regional Research Publication.
Pt. 2, Railroad rates on dressed turkeys to New York, Boston, Philadelphia, and Chicago from ten surplus turkey producing States, includes net cost per pound for shipping dressed turkeys.

596. HALL, J. D., and BREAKIRON, P. L. Reduction of loss and damage in rail transportation of shell eggs by improved loading and bracing. Washington, U. S. Prod. & Mktg. Admin. Mktg. & Facilities Res. Br., 1950. 19 p. 1.956 M343R24
Discusses costs of damage to egg shipments. The relation of lengthwise slack in packing to damage, of wood and straw space

fillers, of type of container, of size of load, and of irregular loads to damage were considered. Improper takeup of lengthwise slack was the most important single loading factor causing damage.

597. HENRY, W. R. On-truck crating reduces broiler hauling costs. N. C. State Col. Dept. Agr. Econ. A. E. Inform. Ser. 63,21 p., illus. Feb.1958. 281.9 N816
Describes a case study of on-truck crating as compared with on-ground crating in terms of time requirements and of hauling costs. States that on-ground crating in hauling the 1956 supply of North Carolina broilers cost about $230,000 more than would have been necessary if on-truck crating had been used.

598. HENRY, W. R., and RAUNIKAR, R. Weight losses of broilers during the live haul. N. C. State Col. Dept. Agr. Econ. A. E. Inform. Ser. 69,43 p. Dec.1958. 281.9 N816
Pt. IV, Reducing weight losses by efficient scheduling of truck arrivals, covers necessity for leadtime in planning for live-hauling, costs of deviations of truck arrivals from a prearranged schedule, an example of truck scheduling, approximating optimum leadtime, an example of excessive leadtime, scheduling weighing instead of arrivals, and potential savings by efficient scheduling.

599. HINDS, R. H. Baby chick transportation problems and equipment. U. S. D. A. Mktg. Res. Rpt. 267,20 p. Aug.1958. 1 Ag84Mr
Describes special motortruck equipment and accessories, many of them home-designed and home-built, as well as body types of vehicles, ventilating, heating, and refrigerating systems, power supply, driver training, and handling and stacking chick boxes. Chicks were hauled over long distances in large numbers in all kinds of weather.

600. JACKS, B. H., and SIMS, J. C. Marketing practices and handling costs of commercial egg handlers in Mississippi. Miss. Agr. Expt. Sta. M. R. 24,17 p. Nov.1958. 100 M69Mr
Investment costs of transportation equipment for small, medium, and large plant size groups are shown on p. 10, and distribution costs for labor and truck expense are given on p. 13-15. Based on a study of twelve firms.

601. JEWETT, L. J., and SAUNDERS, R. F. Handling and processing broilers in Maine. II. Quality losses in live broilers, and methods of handling to reduce bruising and to improve efficiency. Maine. Agr. Expt. Sta. B. 593,22 p. June 1960. 100 M28S
Type of crates used, handling methods, and length of haul were studied. A specially designed crate about twice the size of a regular coop, and divided into two equal compartments, with two large doors on top was tested and found to be more efficient. Man-hours expended per 1,000 birds on loading, unloading, hanging, and reloading empty crates were recorded.

602. JOHNDREW, O. F., and PENCE, F. M. Inner packing materials for egg cases; the results of studies conducted in 1948-49. Washington, U. S. Prod. & Mktg. Admin. Poultry Br., 1950. 40 p. 1.956 P86In6
Packing materials had not kept pace with the increase in size of eggs in the past 30 years, and did not adequately accommodate shell eggs. Many eggs were measured and records of transit damage were made. Fillers, flats, egg trays, and egg cases were tested on

laboratory incline-impact tester and on link-belt vibrating table shaker. The new, larger fillers and flats proved superior in these and in transportation tests.

603. JOHNSON, H. D., and GERRITY, M. V. Report of tests on transportation of frozen poultry with mechanically refrigerated trucks; an interim report. Washington, U. S. Prod. & Mktg. Admin. Mktg. & Facilities Res. Br., 1952. 21 p. 1.956 M343R9
Two tests were made to learn if lower transit temperatures than those maintained with the usual equipment could be obtained in mechanically refrigerated trucks equipped with return air ducts and loaded in such a manner as to provide better air circulation along the bottom of the loads.

604. JOHNSON, H. D., and GARVER, C. E. Test of a mechanical refrigeration unit designed to maintain low temperatures in motor-truck transportation; an interim report. Washington, U. S. Prod. & Mktg. Admin. Mktg. & Facilities Res. Br., 1953. 18 p.
1.956 M343T284
Reports on a relatively new type of mechanical refrigerating unit used in a truck carrying frozen turkeys from California to Massachusetts. Temperature records of cargo were kept.

605. KING, R. A., and ZWICK, C. J. Competitive position of the Connecticut poultry industry. 4. Shrinkage of live poultry between farm and markets. Conn. (Storrs) Agr. Expt. Sta. B. 270,20 p., tables. Oct.1950. 100 C76S
The level of shrinkage depends on temperature, humidity, age, breed and strain of the birds, distance from market as well as on time and feeding methods. A chart shows the effect of growing ration, method of handling, and time elapsed on shrinkage.
Also in condensed form in U. S. Egg & Poultry Mag. 56(6):14-15, 29-30. June 1950. 286.8 Eg3

606. KOUDELE, J. W. Egg and other produce procurement costs. Kans. Agr. Expt. Sta. C. 304,27 p.,tables,charts. Mar.1954. 100 K13S
A study of 14 Kansas firms operating farm truck routes. Contains information on number and size of trucks, routes, types and volume of commodities hauled, delivery costs by commodities and per truck, factors associated with hauling costs, and truck-servicing policies.

607. MORTENSON, W. P. A study of egg handling in Wisconsin. Wis. U. Col. Agr. Dept. Agr. Econ. Ag. Econ. 28,25 p. Jan.1959. 281.9 W75
Analyzes operations of a large sample of egg handlers. Appendix B shows averages of cost items for 60 percent of the firms studied, 1946-1955. Trucking costs were 16 percent of the total handling costs.

608. MORTON, N. Supreme Court and inconsistency of 'Agricultural exemptions'. Traffic World 98(8):81-83. Aug.25,1956. 288.8 T672
Whether dressed poultry is entitled to any different treatment in the matter of motor carrier exemptions than that accorded dressed meat, and whether equalization in treatment should be effected by suitable regulatory amendment, are the subjects considered.

609. OYLOE, T. Marketing policies and practices of country egg dealers in eastern South Dakota. S. Dak. Agr. Expt. Sta. C. 143, 23 p. June 1958. 100 So82
Transportation of shell eggs to central markets, p. 8-11.

610. RATCLIFFE, H. E. Cooperative marketing of eggs and poultry in Ohio. U. S. Farm Credit Admin. B. 59,69 p.,illus.,tables. May 1959. 166.2 B87
Nine cooperative associations which are well scattered over the State were studied. A section of this bulletin deals with assembling of eggs, p. 17-25, and includes a table showing number of routes operated, frequency of pickup, number of eggs picked up, time required on routes, number of stops, type and capacity of trucks, and number of producer, private, and association trucks used. Transportation to receivers, including costs, is discussed, p. 36-37.

611. RATCLIFFE, H. E. Cost of marketing eggs and labor output of selected cooperatives. I. Northeast. II. North Central States. III. Western States. U. S. Farmer Coop. Serv. Gen. Rpt. 59,28 p. May 1959; 72,36 p. May 1960; 75,34 p. July 1960. A280.29 F22G
Shows labor and truck costs and output for the following: Collecting, receiving, cartoning, and packing cartoned eggs; coopering cases; stacking, loading out, and delivering. Also shows costs of packing material. Includes several tables and many illustrations.

612. RINEAR, E. H. Problems of transporting and marketing hatching eggs and baby chicks in the Northeastern States. Washington, U. S. Prod. & Mktg. Admin. Poultry Br., 1950. 23 p. 1.956 P86P942
Compares rates and losses when shipped by railway express and by truck from New England to the Del-Mar-Va Peninsula. Also considers causes of loss, effect of trucking on breakage and hatchability of eggs, and losses of baby chicks shipped by parcel post.

613. ROGERS, G. B., JONES, H. B., and BARDWELL, E. T. Assembling New England poultry. U. S. Agr. Mktg. Serv. AMS-309: 32-37. Apr.1959. A280.39 M34Am
Reprinted from the Marketing and Transportation Situation, April 1959. 1.941 M8M34
States that processing plants and firms servicing these plants have become the primary assemblers of poultry. Defines the types of assembling firms, and shows the volume handled by each. Performance efficiency is shown for processing plants, contract haulers, contractors, live-poultry buyers, live-poultry stores, and small slaughterers.

614. ROTHBAUER, T. C., WOOD, G. B., and MARTIN, J. H. Poultry and egg truck routes in Indiana. Ind. Agr. Expt. Sta. B. 571, 31 p. Jan.1952. 100 In2P
A study of the nature of operations and costs in assembling poultry and eggs, and ways of increasing efficiency and reducing costs. Includes time studies of drivers work, distances traveled, number of stops, accessibility of farm storage and other aspects.

615. SIMMONS, W. M. Shrinkage and mortality in shipments of live chickens received at New York City live poultry terminal 1949-1950. N. Y. Cornell U. Col. Agr. Dept. Agr. Econ. A. E. 771,24 p. May 1951. 281.9 C81

In 42 truckloads of chickens, shrinkage averaged 4.4 percent. The weight of birds per coop was the most important single factor influencing shrinkage. Other factors were temperature, humidity, weight per load, miles shipped, and time on truck. Shrinkage in shipments in 1950 alone added about three-quarters of a million dollars to the marketing cost for 118 million pounds of live poultry.

616. SIMMONS, W. M. Shrinkage in shipment of live chickens. Cornell U. Col. Agr. Dept. Agr. Econ. & Farm Mangt. Farm Econ. 184:4820-4822. Mar.1952. 280.8 C812
Truckloads of live chickens were studied to determine the effects of temperature, humidity, weight of load, distance shipped, and time on truck, on shrinkage.

617. SMITH, T. B. Shipping containers for frozen tom turkeys. U. S. D. A. Mktg. Res. Rpt. 354,15 p.,illus. July 1959. 1 Ag84Mr
Of 800 containers moved by truck for 3,000 miles, the factors found to be of prime importance in protecting the product and preventing damage to containers were: Size and shape of container, how the product fit in the container, stacking strength and construction design, along with the care and skill used in processing and handling at the processing plant and at the receiving end.

618. SNITZLER, J. R., and BYRNE, R. J. Interstate trucking of fresh and frozen poultry under agricultural exemption. U. S. D. A. Mktg. Res. Rpt. 224,88 p.,tables. Mar.1958. 1 Ag84Mr
Gives information on the volume of shipments and market distribution of fresh and frozen poultry by geographic regions and by type of carrier, and on different phases of service, on freight rates, and on equipment in order to compare regulated and exempt motor carriers.

619. STEMBERGER, A. P. Evaluating the competitive position of North Carolina eggs by use of the transportation model. J. Farm Econ. 41(4):790-798. Nov.1959. 280.8 J822
An 88-region model of the egg sector of the economy was studied with a view to determining North Carolina's best egg markets and locational advantage. A sample of transportation rates was obtained from egg marketing firms by means of a questionnaire.

620. THOMPSON, W. H. Transportation of poultry and poultry products from the North Central States. S. Dak. Agr. Expt. Sta. B. 472,46 p.,maps,tables. Oct.1958. 100 So82
This is also North Central Regional Publication 92.
Studied changes in methods of transportation, time in transit, costs, weight in relation to costs, origin and destination of shipments, volume of shipments of poultry, eggs, and turkeys, mileage of shipments by motor and rail, seasonal fluctuations, movements of poultry and products from key origins to representative destinations, and average costs of movements by private and by for-hire motor carriers.

621. THOMPSON, W. H. Transportation of poultry feed ingredients from the North Central States. S. Dak. Agr. Expt. Sta. B. 485, 43 p. May 1960. 100 So82
This is also North Central Regional Publication 109, and second in a series of bulletins.
A study of the carriers, types of services used, traffic flow patterns to markets in competing broiler producing regions, charges, length of haul, routing, season of movement, and special services required in transportation of corn and soybean oil meal.

622. U. S. AGRICULTURAL MARKETING SERV. POULTRY DIV. A digest of the regulations governing the transportation of poultry and poultry products. U. S. Agr. Mktg. Serv. AMS-406,2 p. Sept. 1960. A280.39 M34Am
Definitions, rules, and records.

623. U. S. AGRICULTURAL MARKETING SERV. POULTRY DIV. United States standards for shell egg packs. U. S. D. A. Agr. Handb. 145,29 p.,illus. June 1958. 1 Ag84Ah
Describes and gives specifications for shipping containers for shell eggs, including fiber and wooden cases, fillers, flats, and egg trays, and for various cartons for retail and for hatching egg shipment. Containers for duck and turkey eggs are included.
Supersedes Agricultural Handbook 86, United States standards for containers, packing materials, and packs for shell eggs, issued July 1955, and all earlier editions.

624. U. S. PRODUCTION AND MARKETING ADMIN. POULTRY BR. Regional marketing problems of the hatching egg industry in the Northeast. Washington,1951. 15 p. 1.956 P86R26
Extent and causes of damage claims to hatching eggs and to chicks, in transit, charges for trucking, and effect of trucking on breakage and hatchability of eggs are shown, p. 11-15.

625. WILSON, W. O. Internal temperatures of chick shipping boxes as influenced by environmental temperatures. Poultry Sci. 29(2):276-284. Mar.1950. 47.8 Am33P
Studied the effect of controlled room temperatures on the temperature inside the shipping boxes filled with chicks, and effect of using different sizes of boxes with different numbers of holes in each.

626. ZWICK, C. J., and KING, R. A. Competitive position of the Connecticut poultry industry. 5. The economic advantage of location in marketing live poultry. Conn. (Storrs) Agr. Expt. Sta. B. 293, 30 p. Sept.1952. 100 C76S
Labor used in shipping live poultry from farm to market, and truck costs for shipping live poultry, are discussed on p. 11-24.
In the marketing survey, it was found that 70 percent of the poultry is hauled to New York by tractor and semitrailer combinations. The weighted average load was 13,200 pounds per trip.

Vegetables

General

627. BARGER, W. R., and RADSPINNER, W. A. Transit refrigeration studies with California prepackaged carrots, a progress report. U. S. Agr. Mktg. Serv. AMS-97,21 p. Apr.1956. A280.39 M34Am
Shipments made in various containers and with different protective services found that carrots were difficult to cool in transit. Prompt cooling and low transit temperatures were found to be necessary to insure an adequate shelf life.
Contains 18 pages of tables and graphs.

628. BARGER, W. R. Transit-refrigeration studies with prepackaged carrots. Conf. Transportation Perishables. Proc. 1956: 50-56,illus. 280.39 C765

Found that transit temperatures close to 40° F. are necessary to insure the shelf life of prepackaged carrots susceptible to decay.

629. BARGER, W. R., and others. Transit temperatures in California lettuce. U. S. D. A. Mktg. Res. Rpt. 285,16 p. Nov.1958. 1 Ag84Mr
J. K. Stewart, J. M. Harvey, M. J. Ceponis, L. L. Morris, and R. F. Kasmire, joint authors.
Studied the effects on temperature of salting, size and pattern of load, type of container, fans in ice-refrigerated cars, and mechanical refrigerator cars. The lettuce was vacuum-cooled, drypacked, and shipped by rail from California to New York City.

630. BARRY, G., BLACK, W. R., and CHAPOGAS, P. G. Evaluation of fiberboard shipping containers for lettuce. U. S. D. A. Mktg. Res. Rpt. 248,38 p. July 1958. 1 Ag84Mr
In a study of three different containers, it was found that as the weight of the pack increased from light and medium to heavy, bruising of the lettuce increased. There was no definitive difference in performance among the three containers, but the tightness of pack was a measure of bruising.

631. BREAKIRON, P. L. Reduction of loss, damage, and transportation costs in package-iced shipments of lettuce and carrots. Washington, U. S. Prod. & Mktg. Admin., 1953. 45 p. 1.956 M343R244
Western Growers Association, cooperating.
The Western or Los Angeles crate for shipping lettuce and carrots was compared with the new Western Growers Association crate for size and suitability for lettuce packs, cover bulges, container breakage in transit and in unloading, commodity bruising, and costs of refrigeration, transportation and bracing materials. Methods of loading and effects of pack ice were studied.

632. BROOKE, D. L., and SMITH, C. N. Distribution of Florida peppers; seasons 1952-53 and 1953-54. Fla. Agr. Expt. Sta. Dept. Agr. Econ. Agr. Econ. Mimeo. Rpt. 60-1,14 p. Sept.1959. 281.9 F663
Shows proportion of peppers shipped by rail and by truck, by market area, and volume diverted en route to destination.

633. GINN, J. L., and HALE, P. W. Packaging California cauliflower. U. S. D. A. Mktg. Res. Rpt. 414,36 p.,illus. July 1960. 1 Ag84Mr
Evaluates various conventional and experimental containers for bulk and prepackaged cauliflower. Describes new master shipping containers and films. Gives costs of loading and transporting to terminal market by type of container, comparative total cost of packing and shipping, costs of labor, freight, and containers.

634. GREIG, W. S., and SPURLOCK, A. H. Margins and costs in marketing Florida sweet corn. U. S. D. A. Misc. P. 719,11 p.,illus. Apr.1956. 1 Ag84M
Illustrates the costs involved in moving a car of sweet corn from Florida to Baltimore in May 1955 and gives expenses for each operation, from producer to consumer. Transportation was found to be 20.9 percent of the total cost paid by the consumer.

635. HALE, P. W., and STOKES, D. R. Shipping containers for prepackaged carrots. Agr. Mktg. 1(2):4-5. Aug./Sept.1956. A280.38 Ag8

Description, costs, and durability of three different types of master containers. They were a wirebound crate, a multiwall paper bag and a polyethylene bag.

636. HUBBARD, O. D. Western lettuce—an industry in transition. Ariz. Agr. Expt. Sta. Rpt. 151,46 p. Feb.1957. 100 Ar4M
Information on containers and their costs, breakage, damage, freight rates, and carlot unloads by origin of shipments is given on p. 27-36.

637. KAUFMAN, J., HRUSCHKA, H. W., and WIANT, J. S. Rail shipping tests with Long Island cauliflower, 1949. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 228,8 p.,tables. July 1950. 1.9 P772Ht
Concludes that the shipments to midwestern and southern markets, if loaded 400 crates to the car, should receive bunker ice as well as top ice. There appeared to be a definite advantage in favor of the modified 381-crate load over the tightly packed 400-crate load.

638. KAUFMAN, J., HRUSCHKA, H. W., and WIANT, J. S. Rail shipping tests with Long Island cauliflower - 1950. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 259,10 p.,tables, charts. 1951. 1.9 P772Ht
Tests were made with 12 cars of 381-crate loads to compare different methods of refrigeration in fan cars and in nonfan cars.

639. KAUFMAN, J., HRUSCHKA, H. W., and WIANT, J. S. Rail shipping tests with Long Island cauliflower, 1951. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 268,4 p.,tables,charts. Apr.1952. 1.9 P772Ht
Studied the top icing requirements for shipments of cauliflower packed in wirebound crates and destined for midwestern markets.

640. KAUFMAN, J., and HRUSCHKA, H. W. Truck shipping tests with Long Island cauliflower, 1950-52. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 291,6 p.,tables, charts. Apr.1953. 1.9 P772Ht
Lengthwise loading was preferable to crosswise loading and top-iced trucks with vents closed and fans on did not permit adequate air circulation beneath the load to cool the bottom layers.

641. KAUFMAN, J., and HRUSCHKA, H. W. Truck shipping tests with Long Island cauliflower, 1953. U. S. Agr. Mktg. Serv. AMS-1, 16 p. Nov.1954. A280.39 M34Am
The modified lengthwise loads cooled faster and had lower transit temperatures than conventional lengthwise loads when both were iced with top ice only. Bunker icing in addition to top icing resulted in better temperatures than top icing alone.

642. KUSHMAN, L. J., and others. Temperature and quality records for sweetpotato truck shipments, 1950-51 season. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 254,4 p.,tables, charts. July 1951. 1.9 P772Ht
G. B. Ramsey, M. A. Smith, and W. R. Wright, joint authors.
Records were made of air and commodity temperatures for sweetpotatoes packed in crates and shipped in vans using heavy and light insulation from New Orleans to Chicago. Weight loss and decay loss in transit and in terminal markets were recorded.

643. LANGFORD, W. B., and NEAL, J. D. Some aspects of the problem of transporting fresh vegetables from Texas. Tex. Engin. Expt. Sta. B. 118,62 p. June 1950. 290.9 T31
Contains 13 detailed tables and 5 extensive appendices. The tables and the analysis indicated that the carload rates on fresh vegetables from the Rio Grande Valley were appreciable higher, distance considered, than the rates in effect from three Western States. Gives specific rates and distances from many cities to market for various vegetables, and also mileage revenues per car and per mile.

644. LETTUCE clinic; a symposium. Conf. Transportation Perishables. Proc. 1956:102-119. 280.39 C765
Contains summaries of several papers dealing with handling, marketing, and transportation of lettuce. The papers dealing with transportation are: Destination observations on lettuce packaging, loading, and transit refrigeration, by V. T. Jessen; Lettuce transit study, by L. L. Morris; and Transit problems as viewed by the shipper, by T. C. Curry.

645. LIEBERMAN, M., and SCHOMER, H. A. Sweet corn shipping tests - June 1948. U. S. Bur. Plant Indus. Soils Agr. Engin. H. T. & S. Off. Rpt. 204,4 p.,tables. Mar.1949. 1.9 P772Ht
Three truck shipments were made from North Carolina to Baltimore using three different loading and refrigeration methods. Best results were obtained by using block ice in the body and snow ice between the layers of corn.

646. MASTERS, B. M., WINTER, J. C., and ROSANOFF, B. P. Potential savings by shipping cauliflower in double-layer packs. U. S. D. A. Mktg. Res. Rpt. 78,16 p. Mar.1955. 1 Ag84Mr
Substantial savings in costs of containers, transportation, and refrigeration were possible by trimming the cauliflower heads closer, and by packing two layers, instead of one, in a slightly larger shipping container.

647. MYERS, E. C. Tests of strapped and light-weight lettuce crates. Forest Prod. Res. Soc. Proc. 4:83-90. 1950. 99.9 F7662P
Discussion, p. 89-90.
Laboratory, packing, and transportation tests showed that crates strapped girthwise were stronger and that strapped, lightweight crates were nearly as strong as standard crates not strapped.

648. RION, K. E. A report on No. 516 celery crate. Natl. Conf. on Handling Perishable Agr. Commod. Papers 14:57-73,illus. Mar. 1960. 280.39 N2123
Found that heavy top ice contributes toward damage. Use of a stronger cover such as the 4-slat suggested by the National Container Committee, would help prevent damage, as would onend loading.

649. RYALL, A. L. Precooling and transit temperatures of western lettuce. Conf. Transportation Perishables. Proc. 1954:83-93,charts. 280.39 C765
Describes winter tests made in the Imperial Valley to study containers, precooling methods and transit protective services as related to cooling rate, temperature during transit, and lettuce condition at market.

650. SCHOMER, H. A., SHOWALTER, R. K., and REUBELT, V. A. Air shipment of prepackaged sweet corn from Florida. Pre-Pack-Age 6(5):11-13. Jan.1953. 280.38 P91
Shipping tests show that sweet corn can be carried at satisfactory temperature in higher altitudes by plane, but precooling is recommended.

651. SORENSEN, H. B., PAULSON, W. E., and ENGELBRECHT, W. H. Containers used to ship vegetables in mixed carload from the Lower Rio Grande Valley, 1951-52 season. Rio Grande Valley Hort. Inst. Proc. 8:60-63. 1954. 81 L95
Many different vegetables were shipped in 11 different named types of containers.

652. SORENSEN, H. B., and PAULSON, W. E. Mixed carload distribution of vegetables from the Lower Rio Grande Valley, 1951-52 season. Tex. Agr. Expt. Sta. Rpt. 1616,5 p. Sept.23,1953. 100 T31P
Shows the volume of the various vegetables moving in mixed carloads.

653. STEWART, J. K. Precooling and transit tests with lettuce. Amer. Soc. Hort. Sci. Proc. 68:288-295. 1956. 81 So12
Ten of the refrigerator cars used from Tucson, Ariz., were fan-precooled and one was vacuum-cooled. Temperature data were obtained during precooling and in transit. Adequate spacing of cartons increased precooling efficiency.

654. THOMPSON, J. A. Bulk shipping of navy beans. Agr. Mktg. 3(8):5. Aug.1958. A280.38 Ag8
Savings in loading and unloading time, elimination of the costly process of bagging and sewing, of bag conveyors and handtrucks, and of tedious hand stacking are advantages. Research is still in progess on moisture control in cars and how to avoid injury in conveying the beans mechanically.

655. TRANSPORTATION problems of lettuce shippers; a symposium. Conf. Transportation Perishables. Proc. 1958:124-136. 280.39 C765
Contains summaries of papers by R. R. Scott, G. B. Ramsey, J. M. Harvey, and G. A. Peters dealing with load patterns, containers, refrigeration, humidity, and vacuum-cooling.

656. U. S. DEFENSE TRANSPORT ADMIN. Transportation of fresh vegetables 1952. 44 p.,illus.,maps. Washington, 1952. 173.3 D364
A national survey of truck and rail transportation in order to estimate the ability of carriers to meet future emergencies. Charts and tables show production areas, market destinations, seasonality of movements, quantities moved by trucks, and includes percentages of crops moved from farm to initial markets in farm-owned and in buyer's equipment. Comments on the need for current statistics on domestic transportation.

657. VOEGELI, L. J., and others. Packing and shipping lettuce in fiberboard cartons and wooden crates - a comparison. U. S. D. A. Mktg. Res. Rpt. 86,30 p. Apr.1955. 1 Ag84Mr
E. F. White, B. Masters, and P. L. Breakiron, joint authors.

Dry-packing lettuce in fiberboard cartons in the field or packingsheds and vacuum-cooling it for shipment, as compared with ice-packing WGA crates in packingsheds, effected substantial savings even though costs for refrigeration in transit were higher. Costs are shown for harvesting, packing, shipping, and refrigeration of California and Arizona lettuce in 1952-53.

658. WINSTON, J. R., CUBBEDGE, R., and KAUFMAN, J. Effect of hydrocooling and of top icing on temperature reduction in carlot shipments of crated green sweet corn. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 270,9 p. Apr.14,1952. 1.9 P772Ht
Studied precooling, use of smaller crates, icing services, and the rate of cooling at different levels in the car during transit. Compared the lengthwise and crisscross methods of loading, and compared the performance of fan and nonfan cars.

659. WINTER, J. C., and MASTERS, B. M. Container breakage in top-iced shipments of vegetables. Washington, U. S. Prod. & Mktg. Admin. Mktg. & Facilities Res. Br., 1953. 25 p. 1.956 M343C762
Transportation tests were made on broccoli and celery shipped from California to eastern markets. Factors studied were transit meltage of top ice, location of crates broken in transit in relation to top ice, how depth of top ice affects unloading breakage, and methods of loading.

660. YOUNG, R. E., and KORZAN, G. E. Impact of transportation rates on Oregon's green bean industry. Oreg. Agr. Expt. Sta. C. Inform. 599,4 p. Oct.1959. 100 Or3C
Concludes that any further rate increases will likely reduce grower net returns.

Potatoes

661. BARGER, W. R., and MCKILLOP, A. A. A railway transportation test with California early potatoes - containers, icing practices, and thermostatic refrigeration control. U. S. Agr. Mktg. Serv. AMS-160,10 p. Feb.1957. A280.39 M34Am
Compared the cooling rates and refrigeration requirements of potatoes shipped in 50-pound cartons, 10-pound paper bags, and 100-pound burlap bags, and obtained information on the effect of load pattern on the cooling rate of potatoes in 50-pound cartons. Modified icing was tried for potatoes in bags, and thermostatic control of refrigeration in transit was tested.

662. BARGER, W. R., and HARVEY, J. M. Temperatures in rail shipments of California chipping potatoes. Natl. Potato Chip Inst. Prod. & Tech. Div. Mtg. Proc. 23:25-28. Jan.1960. Private file
Reports on studies made to learn effects of transit temperatures on potato decay and on chip quality.

663. BARGER, W. R., and others. Transit icing tests with early White Rose potatoes from Kern County, Calif., to New York City, May and June, 1950. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 239,9 p.,tables,charts. Dec.1950. 1.9 P772Ht
D. H. Dewey, B. A. Friedman, and A. L. Ryall, joint authors.
Tests showed that potatoes can be shipped successfully during the early season (May) in fan cars not preiced, using either full bunker

icing or half-stage icing. These modified icing services provided favorable temperatures with savings in costs.

664. BARGER, W. R., PENTZER, W. T., and KAUFMAN, J. Transportation test with early White Rose potatoes from Kern County, California, to Chicago, Illinois, and New York City, June 1949. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 216, 17 p., tables, charts. Oct. 1949. 1.9 P772Ht

This is the third test made to determine the relative effectiveness of standard refrigeration and various modified services using less ice, in cars with fans on and fans off, with standard ventilation without ice.

665. BARGER, W. R., and others. Transportation tests with early potatoes from Kern County, California to New York City, May, 1951. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 271, 7 p., tables, charts. Apr. 1952. 1.9 P772Ht

J. M. Harvey, W. A. Radspinner, and L. L. Morris, joint authors.

Temperature and humidity records were made in fan cars to compare various conditions of icing and precooling. The data showed that over-refrigeration in transit prevented the healing of the skinned ends of new potatoes and increased shrivel and objectionable browning during holding at retail markets.

666. BIRD, K. New ideas in packing potatoes. Idaho. Agr. Expt. Sta. B. 284, 11 p., illus. Oct. 1957. 100 Id14

Topics discussed and illustrated are: Fiberboard containers, handling methods and costs, trucks and dumping, pallet handling, bulk boxes, vertical elevators, and filling of sacks.

Part of this material appeared with title A Research study of corrugated fiberboard boxes for potatoes, in Package Engin. 4(4):39-43, 110. Apr. 1959. 280.38 P122

667. BIRD, K. Shipping Idaho potatoes in 50-pound boxes. Idaho. Agr. Expt. Sta. B. 303, 19 p., illus. May 1959. 100 Id14

Thirty-six different types of 50-pound potato cartons were designed and tested to compare with burlap sacks, to minimize bruising and compare costs involved. It was possible to ship 520 cwt. of potatoes in a car with minimum of bruising. This was 40 percent more than was shipped in sacks. Boxes made from 200-pound board were just as good as those made from heavier board.

668. CHURCH, D. E. Recent trends in transportation of potatoes to Washington, D. C. U. S. Bur. Agr. Econ. Mktg. & Transportation Situation MTS-81:8-15. Feb. 1950. 1.941 M8M34

669. CHURCH, D. E. Shipper costs and rail-truck competition affected by changes in source of supply as shown by potato movements to Washington, D. C. U. S. Bur. Agr. Econ. Mktg. & Transportation Situation MTS-75:12-20. Aug. 1949. 1.941 M8M34

States that the leading cause of the variations in average transportation charges and relative volumes hauled by railroads, compared with trucks is the seasonal shift in sources of supply.

670. DAVIS, C. L., and WILCOX, R. W. Quality loss in trial shipments of late-crop potatoes from Idaho. U. S. Bur. Agr. Econ. Mktg. & Transportation Situation MTS-94:7-10. Mar. 1951. 1.941 M8M34

Both shipping-point damage and transit damage were studied.

671. DAVIS, G. B. Marketing potatoes in corrugated fiberboard boxes. Oreg. Agr. Expt. Sta. Mimeo. C. Inform. 516,6 p. Nov.1952. 100 Or3C
The boxes cost more than bags, but they afforded excellent protection to the potatoes from the standpoint of transit and handling damage. The drawback to use of boxes was that not enough work space was available in most farm cellars for cellar packing of boxes.

672. EDGAR, A. D. Shipping potatoes in subzero weather. U. S. Agr. Mktg. Serv. Mktg. Activ. 18(11):10-11,illus. Nov.1955. 1.942 A8M34
Describes a windproof canvas tunnel which enables shippers to load potatoes from warehouse to refrigerator car in subzero temperatures without danger of frost injury.

673. FINDLEN, H., and LUTZ, J. M. Effect of handling, transportation and storage on external quality of potatoes. Potato Util. Conf. Proc. 4:15-16. Aug.1952. 1.9321 E2C76

674. FINDLEN, H., HEINZE, P. H., and LUTZ, J. M. Influence of loading temperature of potatoes, type and number of heaters and type of car on potato transit temperatures East Grand Forks, Minnesota, to Chicago, Illinois, January 1951. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 251,8 p.,tables,charts. July 1951. 1.9 P772Ht
Tests were made to compare underslung heater cars with a fan car heated by two portable charcoal heaters. Discusses the number and type of end-bunker heaters needed for protection from freezing.

675. FINDLEN, H., and HANSEN, J. C. Transportation of late-crop potatoes for chipping. Natl. Potato Chip Inst. Prod. & Tech. Div. Proc. p. 3-6. Jan.1958. Private file
Reprinted by the U. S. Agricultural Marketing Service, September 1958.
Nine semi-trailer truck and two rail shipments of potatoes were tested to provide information on the temperatures that occur in winter truck and rail shipments.
Also in abstract form in Potato Util. Conf. Proc. 8:33. Aug.1957. 1.9321 E2C76

676. FOLSOM, D., and others. Effect of storage and railroad transit on potato diseases, injuries, and shrinkage. Maine. Agr. Expt. Sta. B. 507,28 p. Ref. Dec.1952. 100 M28S
H. Q. Roach, J. S. Wiant, and J. Kaufman, joint authors.
Describes changes in diseases and defects of potatoes shipped by rail from Maine to New York, 1947-1949. Transit temperatures were recorded.

677. HALE, P. W., and CHAPOGAS, P. G. Packing California potatoes in fiberboard boxes. U. S. D. A. Mktg. Res. Rpt. 214,24 p., illus.,tables. Mar.1958. 1 Ag84Mr
It cost about 51 cents more to market White Rose potatoes in 50-pound fiberboard boxes than in 100-pound burlap bags in 1957, but the boxes protected the potatoes from bruising in transit much better than the bags. Material costs are given, as are labor requirements in minutes for various operations, and container damage and potato bruising is shown.
Reprinted in Kern Co. Potato Growers Assoc. Ybk. 14:37,39,41,43, 45,47,49,51,53. 1958. 286.3759 K45A

678. HANSEN, J. C., FINDLEN, H., and WINSTON, J. R. Comparison of ventilation and icing services for early-crop seed potatoes North Dakota to Florida, September 1953. U. S. Agr. Mktg. Serv. AMS-42, 11 p., charts. Aug. 1955. A280.39 M34Am
Compared fan cars with fans on and off, with nonfan cars and half-stage and full bunker initial icing.

679. HANSEN, J. C. Winter truck transportation tests with chipping potatoes from Red River Valley. Natl. Potato Chip Inst. Prod. & Tech. Div. Mtg. Proc. 1959:9-11. Private file
Reprinted by the U. S. Agricultural Marketing Service, October 1959.
Placing one thermostatically controlled heater in the front and one in the rear of the load provided the most uniform top and bottom layer temperatures in tests to determine the best heater location and the value of floor racks.

680. HEINTZ, R. J. Development of temperature control systems in truck and rail transit of potatoes. Potato Chipper 14(11):78, 80, 82-85. June 1955. 75.8 P844
Reviews tests formerly made on potato temperatures during transit, and describes a study made to develop simultaneous control of cooling and heating of potatoes in insulated motortrucks and in rail cars.

681. HEINZE, P. H. Handling, storage and transportation studies of potatoes. Potato Chipper 17(2):93-96. Sept. 1957. 75.8 P844
Reprinted by U. S. Agricultural Marketing Service, October 1957.

682. HRUSCHKA, H. W., and others. Healing precut potato seed pieces during transit. U. S. Agr. Mktg. Serv. AMS-334, 24 p., illus. Sept. 1959. A280.39 M34Am
W. L. Smith, H. V. Toko, and R. V. Akeley, joint authors.
Fairly high temperature and humidity and circulating air was needed for wound healing of precut potatoes. The 100-pound burlap bags were loaded into preheated, insulated, fan-equipped refrigerator railroad cars. Tables show temperatures during loading and transit, in the bags, in the car, and outside the car. The precut seed pieces arrived at destinations in excellent healed-over condition ready to store or plant.

683. HRUSCHKA, H. W., and REDIT, W. H. Loading methods and protective services for winter shipments of Maine potatoes by rail. Potato Util. Conf. Proc. 7:16-19. Aug. 1956. 1.9321 E2C76
Deals with preheating cars, papering cars, fans, load patterns, and pallet boxes.

684. JOHNSTON, E. F., and BOWMAN, E. K. Mechanized methods of receiving potatoes at Maine trackside storages. Maine. Agr. Expt. Sta. B. 585, 75 p., illus., tables. Sept. 1959. 100 M28S
Deals with mechanized systems and the cost of their operations compared to the conventional barrel hoist system. Describes, compares, and evaluates the conveyor-elevator system of receiving from barrels or from hopper-body trucks, the bin loader system, and the pallet box system, in terms of flexibility, tuber injury, and manual effort required.

685. KENNEDY, E. J. Use of pallet boxes for potato shipments. Potato Chipper 15(10):82-84, 86-87. May 1956. 75.8 P844

Shipping studies were made with pallet boxes as a dual purpose box for both truck and rail shipments. Comments on dimensions and capacity of boxes, container materials, as well as reusability, practicality, and tariff rates.

686. KUSHMAN, L. J. Changes in chipping qualities of Russett Sebago potatoes during and after shipment from Alabama to Wisconsin, 1956-57. Natl. Potato Chip Inst. Prod. & Tech. Div. Mtg. Proc. Jan. 1958:6-8. Private file
Reprinted by the U. S. Agricultural Marketing Service, September 1958.

687. KUSHMAN, L. J., RADSPINNER, W. A., and JOHNSON, J. M. A comparison of various types of truck shipments of washed nondried early Irish potatoes from Camden, North Carolina, to New York, New York, 1950 season. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 257, 9 p., tables, charts. Aug. 1951. 1.9 P772Ht
Temperatures in transit and their relation to decay, dessication, and loss of weight were studied with potatoes packed in 100-pound burlap bags and carried in semiopen trucks, in vans solidly loaded, in vans loaded in layers for ventilation, and in iced and in precooled loads.

688. KUSHMAN, L. J., GREENE, R. E. L., and WHITE, M. Transportation tests with early Irish potatoes from the Southeastern States, 1950 season. South. Coop. Ser. B. 31, 32 p. Ref. Apr. 1953.
100 G29So
Studied the use of perforated paper bags and colored wax on potatoes, the value of washing potatoes with chlorine solution for decay control in shipments, various types of truck shipments and methods of preparation of potatoes, and the shipping and chip-making qualities of certain varieties of potatoes. Weight loss, dessication damage, and decay were noted.

689. LUTZ, J. M., and others. Influence of pads and car lining on potato transit temperatures, East Grand Forks, Minnesota, to Chicago, Illinois, January, 1952. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 274, 7 p., tables, charts. Apr. 1952.
1.9 P772Ht
W. H. Redit, R. E. Hardenburg, and H. Findlen, joint authors.
Studies of alcohol and charcoal heating of rail cars, loading patterns of the bags within the car, fan and nonfan cars, blanket pads and paper floor linings as methods of protecting potatoes from freezing in very cold weather.

690. LUTZ, J. M. New trends in potato handling, storage, and transportation. Potato Util. Conf. Proc. 9:22-27. Aug. 1958.
1.9321 Ec3C76
Reviews trends in refrigeration of rail shipments, heavy loads, shipment of precut seed, shipments by truck and in pallet boxes.

691. LUTZ, J. M., and others. Refrigerator car preheating tests comparing alcohol, end bunker charcoal, and underslung charcoal heaters, Grand Forks, North Dakota, February and March, 1950. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 230, 13 p., tables, charts. Sept. 1950. 1.9 P772Ht
V. Reubelt, H. Findlen, and A. D. Edgar, joint authors.

The heaters used in cars for shipment of potatoes during winter months were compared for fuel consumption, heating efficiency, speed of heating, and heat loss while airing out to eliminate toxic gases.

692. MCGAHA, M. E. Deterioration of Long Island potatoes in marketing channels. Washington, U. S. Prod. & Mktg. Admin. Fruit & Veg. Br., 1950. 16 p. 1.956 F94D48
In cooperation with Cornell Agricultural Experiment Station and New York State Department of Agriculture and Markets.
Damage occurring between shipping point and retail store was considerable. The chief factor in deterioration was rough handling during packing for shipment and loading and unloading. Tossing the bags, careless stacking, dropping bags from tailgate, walking on top of bags, and battering with handtrucks passing by, were damaging practices.

693. MAINE. UNIVERSITY. COLLEGE OF AGRICULTURE. EXTENSION SERV. Arrangement for loading 50,000 lbs. of potatoes in 50-pound master containers. Maine. Agr. Col. Ext. Maine Ext. Serv. C. 331,4 p. Jan.1958. 275.29 M281C
Diagrams and instructions. Loading method is recommended by the Association of American Railroads.

694. PERRY, A. L., and MERCHANT, C. H. Development of defects in potatoes between shipping points in Aroostook County, Maine and wholesale and retail markets in Boston, Massachusetts. Maine. Agr. Expt. Sta. B. 484,35 p. Sept.1950. 100 M28S
About half the increase in defects, chiefly cuts and bruises, developed between shipping points and wholesale markets and the other between wholesale markets and retail stores. Responsible were handling and transportation, but also lapse of time between shipping points and retail markets, size of container used, and differences in light conditions under which inspectors worked.

695. PERRY, A. L. Tests of various types of containers for potatoes. Maine. Agr. Expt. Sta. B. 512,19 p. Mar.1953. 100 M28S
The containers were evaluated by dropping tests, less-than-truckload shipments. Boxes were high in cost as compared with bags. The prevention of bruising was studied in relation to the cost of containers.

696. POTATO clinic; a symposium. Conf. Transportation Perishables. Proc. 1958:157-191. 280.39 C765
Contains texts or summaries of papers dealing with transportation of potatoes, by L. C. Krames, J. C. Kaspar, E. F. Johnson, G. A. Border, R. O. Watson, J. W. Oswald, B. Leigh, M. P. Newton, W. R. Barger, J. K. Stewart, and R. F. Kasmire. They deal with rail and truck transport, for-hire motor carriers, long and short hauls, floor pads for transit protection, refrigeration, and containers.

697. PRELI, L. A. Shipping spuds in poly bags. Prod. Mktg. 1(10):31-32. Oct.1958. 280.38 P943
Test shipments of potatoes from California to New York in bunker iced railroad cars were in transit 8 or 9 days. The 10-pound polyethelene bags were packed into 50-pound paper baler bags for shipping. The potatoes in film bags averaged 4 ounces less weight loss than those packed in paper mesh window bags, and their texture and quality was better.

698. REDIT, W. H., and LUTZ, J. M. Heater tests with winter shipments of Maine potatoes by rail, January and February 1954. U. S. Agr. Mktg. Serv. AMS-7,30 p.,tables,charts. Jan.1955. A280.39 M34Am

Information was obtained on the effects of different types of car papering on potato temperatures in transit, the comparative performance of thermostatically controlled alcohol heaters, portable charcoal heaters, and underslung charcoal heaters, and the effect of fans on heater performance and potato temperatures in transit.

699. REDIT, W. H., and others. Tests of railroad protective services for winter shipments of Maine potatoes, December 1952 to February 1953. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 297,29 p.,tables,charts. June 1953. 1.9 P772Ht

J. M. Lutz, J. Kaufman, and H. Findlen, joint authors.

Gives information on the performance of heaters and car equipment, commodity temperatures in transit, various types of loading methods, and cause of paper bag breakage from wetting.

700. REDIT, W. H. The transportation of potatoes. Potato Util. Conf. Abs. Papers 5:6-8. Nov.1953. 1.9321 E2C76

On the protection of early and late crop potatoes from California and Florida during warm and hot weather, and protection against freezing.

701. REDIT, W. H., and LUTZ, J. M. Transportation test with potatoes under heater and ventilation service, Grand Forks, North Dakota to points in Texas, April 1949. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 209,25 p.,tables,charts. June 1949. 1.9 P772Ht

Tests to compare controlled conditions provided by the Thermo-King unit with a combination CPS (Carriers' Protective Service)-controlled ventilation service, a CPS-KVC (keep vents closed) service to Kansas City and standard vent beyond, and regular CPS. The effects of using individual floor pads to prevent bruising of potatoes in bottom layer bags was also studied.

702. RYALL, A. L. Refrigeration of California early potatoes. Kern Co. Potato Growers Assoc. Ybk. 11:89,91,93,95. 1955. 286.3759 K45A

A review of results based on studies of transit temperature and commodity conditions of 43 carloads of potatoes moved to eastern markets during May and June 1948 through 1951. Objects were to determine which modified services could safely be substituted for standard refrigeration, and temperatures favorable to the healing of skinned potatoes during transit. Modified icing, precooling, use of fans in cars, full-bunker, and half-stage icing were studied as related to outside temperatures.

Also issued as reprint with call no. 295.R95.

703. RYALL, A. L. Refrigeration of California early potatoes in transit. Conf. Transportation Perishables Proc. 1953:111-116. 280.39 C765

White Rose potatoes were tested with various icing conditions, precooled loads, in fan cars, and with restricted air movement.

Also in Kern Co. Potato Growers Assoc. Ybk. 9:135-136,139-140,142,144. Mar.1953. 286.3759 K45A

704. RYALL, A. L., and BARGER, W. R. Transit refrigeration studies with White Rose potatoes in various shipping containers. Kern Co. Potato Growers Assoc. Ybk. 13:55,57,59,61,63. 1957. 286.3759 K45A

Compared the refrigeration requirements of potatoes in 50-pound cartons and 10-pound ventilated bags with those in 100-pound burlap bags.

705. SNITZLER, J. R. Movements, freight rates, and prices of potatoes; recent trends for nine major markets. Washington, U. S. Agr. Mktg. Serv., 1953. 62 p., maps, tables. A289.22 M34

The discussion is supported by 22 statistical tables giving data on unloads of potatoes in 9 selected markets by type of carrier and by source of supply. Contains information on general rate-level increases and holddowns as they affect the competitive positions of producers and shippers, ratio of freight rates to wholesale prices, freight rate indexes, effect of rates upon producers and consumers, and gains in truck traffic.

706. SPARKS, W. C. Injury studies on Idaho grown Russet Burbank potatoes. I. Shipping and handling. Amer. Potato J. 27(8):287-303. Aug.1950. 75.8 P842

Considerable injury to potatoes occurred after the potatoes were placed in railroad cars and started on their way to market. The protective ability of various types of containers differed. Burlap bags, wooden crates, paper and meshbags were tested.

Abstract in Potato Util. Conf. Proc. 3:21-23. Mar.1951. 1.9321 E2C76

707. TEAL, R. H., and DAVIS, G. B. Trial shipments of potatoes in corrugated fiberboard boxes. Oreg. Agr. Expt. Sta. C. Inform. 500,16 p. June 1951. 100 Or3C

Oregon Potato Commission and Oregon State Department of Agriculture, cooperating.

The boxes were compared with bags in amount of protection against damage in shipping and handling, and in costs of packing the potatoes.

708. U. S. AGRICULTURAL MARKETING SERV. Comparison of ventilation and icing services for early crop seed potatoes, North Dakota to Florida, September 1953. [Washington, 1954?] 11 p. A75 C73

The tests were made using fan cars and nonfan cars, with fans on and fans off, with vents open and closed, with half-stage and full-bunker initial icing.

709. WERNER, H. O., RYALL, A. L., and LUTZ, J. M. Effect of storage and transit conditions on the performance of Nebraska-grown Triumph seed potatoes shipped in carlots to Texas and Alabama. Nebr. Agr. Expt. Sta. Res. B. 164,94 p., illus. Feb.1950. 100 N27

Sprout growth on arrival was recorded for potatoes shipped in both standard and fan cars, when cold stored and cold shipped, warm stored and warm shipped, cold stored and warm shipped, and warm stored and cooled in transit. There was a pronounced trend for higher yields following warm storage and shipping. The most satisfactory equipment was a fan car with a thermostatically controlled alcohol heater in each bunker and with both fans in operation.

Abstract in Potato Util. Conf. Proc. 3:53-55. Mar.1951. 1.9321 E2C76

710. WHITE, M. Comparison of weight losses and defects in early Irish potatoes shipped by van and open truck, and value of water chlorination in preventing decay. Ala. Agr. Expt. Sta. Prog. Rpt. 49,8 p. June 1951. 100 AL1M
Concludes that vans do not generally provide enough ventilation to have as low a temperature en route as do open trucks, whereas the latter at times provide too much ventilation.

711. WRIGHT, R. C. Bruising, freezing, and chemical injury of potatoes in transit. U. S. D. A. Tech. B. 668, rev., 21 p. Jan. 1952. 1 Ag84Te
In simulated transit tests it was found that most injuries were the result of mechanical bruising against the floor or walls of cars, caused by the weight of the load and the movement of the car. Chemical injury occurred only in conjunction with bruising injury.

Tomatoes

712. ARONOW, W. A., and BRYAN, J. E. Prepackaging tomatoes. U. S. D. A. Mktg. Res. Rpt. 20,56 p. Oct. 1952. 1 Ag84Mr
Advantages and disadvantages of different shipping containers for mature green tomatoes, p. 5-13, deals with lug boxes, field crates, wirebound crates, and nailed crates. Other sections deal with methods of setting up, filling and closing master shipping containers, and methods of removing full master shipping containers.

713. BARGER, W. R. Maintenance of intermediate temperatures in tomato cars and effect on condition of tomatoes on arrival. Conf. Transportation Perishables. Proc. 1954:106-108. 280.39 C765
Results of a third series of tests made jointly by the U. S. Department of Agriculture and the University of California to determine the initial icing needed for tomatoes loaded at different temperatures and to conform to railway icing practices.

714. BARGER, W. R., and others. Shipping tests with California mature-green tomatoes, fall 1951. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 286,6 p., tables. Nov. 1952. 1.9 P772Ht
B. A. Friedman, W. A. Radspinner, and L. L. Morris, joint authors.
The ripening behavior following transit or simulated transit periods point to the harmful role played by temperatures below 50° F.

715. BARGER, W. R., RYALL, A. L., and MCKILLOP, A. A. Thermostatic control of fans in a refrigerator car of tomatoes; a preliminary study. U. S. Agr. Mktg. Serv. AMS-81,16 p. Mar. 1956. A280.39 M34Am
The control resulted in slower cooling of the load and less even distribution of temperature than occurred in a conventionally operated car. Such differences, however, were of minor importance compared to the possibility of avoiding the chilling of tomatoes in transit. Four Santa Fe refrigerator cars were used for this test.

716. BARGER, W. R., and others. Transit and ripening studies with California mature-green tomatoes, fall 1952. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 302,27 p., tables, charts. June 1953. 1.9 P772Ht
W. A. Radspinner, B. A. Friedman, and L. L. Morris, joint authors.

Studied transit temperatures and subsequent ripening responses of tomatoes shipped in end-bunker fan and nonfan cars, with and without ventilation.

717. BARGER, W. A., RADSPINNER, W. A., and MORRIS, L. L. Transit and ripening studies with California mature-green tomatoes, fall 1953. U. S. Agr. Mktg. Serv. H. T. & S. Off. Rpt. 317,22 p.,tables, charts. July 1954. 1.9 P772Ht
Excessive refrigeration resulted in chilling injury, poor ripening, and decay. Moderately high temperatures in transit brought increased pack-out and shorter ripening time.
Also issued as Calif. U. Col. Agr. Dept. Veg. Crops Ser. 66.
81 C1255

718. BARGER, W. R., HARVEY, J. M., and RINGEL, S. M. Transit temperatures of California mature-green tomatoes shipped by rail. U. S. D. A. Mktg. Res. Rpt. 349,12 p. July 1959. 1 Ag84Mr
Transit temperatures of the fruit were compared in a conventional ice-bunker car equipped with electric fans, a mechanically refrigerated car, and a Cargo-temp car. The latter is a modified ice-bunker car equipped with a small diesel engine to power thermostatically controlled fans. Temperatures fluctuated more in the conventional car than in the other two, and the colder temperatures retarded ripening and reduced the percentage of salable fruit. Temperatures in the other two cars remained close to settings of 50° F. and ripening in transit was uniform.

719. BROOKE, D. L., and SMITH, C. N. Distribution of Florida tomatoes: seasons 1951-52 through 1953-54. Fla. Agr. Expt. Sta. Dept. Agr. Econ. Agr. Econ. Mimeo. Rpt. 58-11,36 p.,tables. June 1958. 281.9 F663
Tables show rail and truck shipments by market area and type of sale, shipments diverted en route to destination, and distribution of shipments. Type of containers used for shipping are shown by volume, grade of tomato and type of buyer for wirebound and nailed crates, field boxes, fiberboard boxes, and lugs.

720. ENGER, M. R., and others. Efficiency and potential economics of dual-purpose shipping containers for mature-green tomatoes. U. S. D. A. Mktg. Res. Rpt. 257,69 p.,illus. July 1958. 1 Ag84Mr
K. Myers, P. L. Breakiron, and W. R. Barger, joint authors.
Substantial savings in costs of containers, packing, loading, transportation, and repacking was made by using dual-purpose or reuse 40-pound or 50-pound fiberboard containers. They were used to carry the mature-green fruit from the producing areas to the repacking plants and were reused as master containers to carry small tubes or trays of ripened fruit from the repacking plant to wholesale and retail outlets, instead of using separate containers for each operation.

721. HALSEY, L. H., and others. Containers for shipping Florida tomatoes. Fla. Agr. Expt. Sta. B. 560,32 p. Apr.1955. 100 F66S
L. P. McColloch, A. H. Spurlock, and R. K. Showalter, joint authors.
Field, wirebound, nailed, fiberboard and small Spartan boxes were compared with lug boxes as shipping containers for Florida mature-green tomatoes. Data were obtained on the amounts of pressure bruising, crushing and box-rubbing injury found at destination, on the marketable fruits, and on the comparative costs of packing each type of container. They were tested in commercial truck and rail loads and on a transit simulator.

722. JOHNSON, H. B., and others. Shipping and ripening tests with Texas tomatoes, June 1951. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 265,9 p.,tables,charts. May 1952. 1.9 P772Ht

R. E. Hardenburg, B. A. Friedman, and W. R. Buford, joint authors. Tests were made to find the icing and ventilation services best adapted for warm-loaded, mature-green tomatoes shipped from Texas to Jersey City.

723. JOHNSON, H. B., RADSPINNER, W. A., and RAMSEY, G. B. Shipping and ripening tests with Texas tomatoes, June 1952. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 289,5 p., tables,charts. Apr.1953. 1.9 P772Ht

A study of three test cars showed that standard refrigeration provided over-refrigeration and should be discontinued. Modified icing failed to cool the loads in the top doorway sufficiently because cars were ventilated too soon.

724. JOHNSON, H. B., and others. Texas tomato shipping test from south Texas to Jersey City, New Jersey, May 1950; half stage versus full bunker refrigeration in fan cars with mature green Texas tomatoes in standard lugs. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 246,5 p.,charts. May 1951. 1.9 P772Ht

W. R. Buford, B. A. Friedman, and J. S. Wiant, joint authors. Found that half-stage icing with fan service provided the same amount of refrigeration as full bunker icing with fan service. Both cars were over-refrigerated.

725. JOHNSON, H. B., and NEWSOM, D. W. Transit refrigeration of mature-green tomatoes shipped by rail from the Lower Rio Grande Valley of Texas. U. S. Agr. Mktg. Serv. AMS-188,12 p.,charts. June 1957. A280.39 M34Am

An icing schedule was developed and modified. It was adapted for south Texas conditions and would provide transit temperatures within the desired 55° F. to 65° F. range.

726. MALPHRUS, L. D., and CONLOGUE, R. M. Physical losses, marketing costs and prices of fresh tomatoes; based on shipments from South Carolina and other points to Jacksonville, Florida. S. C. Agr. Expt. Sta. B. 383,32 p.,tables. May 1950. 100 So8

Marketing charges included an average of 5 cents per field box for hauling from field to shed, and 45 cents per field box for truck transportation from Beaufort County to Jacksonville. Of 73.5 cents of the consumer's dollar spent for marketing charges on tomatoes, transportation charges amounted to 5.4 cents, or 4.2 cents for chainstores.

727. PENTZER, W. T., and MCCOLLOCH, L. P. Refrigeration of tomatoes in transit. Indus. Refrig. 125(3):24-28. Sept.1953. 295.8 Ic2

Reviews experiments with ventilation, icing, and effect of transit temperatures on rate of ripening and decay.

728. ROBERTSON, B. C. Types and sizes of containers used for prepackaged tomatoes. U. S. Agr. Mktg. Serv. AMS-52,26 p. Aug. 1955. A280.39 M34Am

Corrugated fiberboard master shipping boxes were found to have different dimensions, and to vary in type and in number of trays they would hold. The establishment of standard sizes is suggested.

729. ROBERTSON, B. C., and ARONOW, W. A. Variation in the quantity of fibreboard used in master containers for prepackaged tomatoes. Washington, U. S. Prod. & Mktg. Admin. Fruit & Veg. Br., 1952. 7 p. 1.956 F94V42
Containers of various sizes, shapes and types were designed to hold from 10 to 32 trays of tomatoes. Types found most economical were the one-piece stitched box, the regular slotted box, and the two-piece half-telescope box.

730. SHOWALTER, R. K., HALSEY, L. H., and MCCOLLOCH, L. P. Injuries in shipping and handling tomatoes. Fla. State Hort. Soc. Proc. 64:125-128. 1951. 81 F66
Found that mature-green tomatoes can be satisfactorily shipped by truck from Florida to northern markets in lugs and in wirebound, nailed or field boxes provided they are properly filled, carefully loaded, sufficiently cooled, and promptly unloaded. Lidded, lined, wirebound, and nailed boxes were better than field boxes or lugs. Rail shipments of field boxes are not recommended.

731. TOMATOES; a symposium. Conf. Transportation Perishables Proc. 1953:127-155. 280.39 C765
Contents: Tomatoes as a carrier problem, by H. Smith, p. 127-129; Tomatoes - carrier problems, by R. L. Gohmert, p. 129-135; Transportation needs of a prepacker, by G. L. Vincent, p. 135-141; Temperature in relation to the ripening behavior of tomato fruits, by L. L. Morris, p. 141-146; Transit studies with California fall tomatoes, by W. R. Barger, p. 147-155.

Other Commodities

732. ANDERSON, F. B. Factors affecting handling costs of cottonseed at gins in Alabama. Ala. Agr. Expt. Sta. B. 292,31 p., illus. Aug.1954. 100 AL1S
Costs of transporting cottonseed to oil mills, p. 19-20. Table 11 shows weighted average transportation costs and oil mill allowances per ton of cottonseed hauled by gin-owned trucks.

733. BARGER, W. R., and RYALL, A. L. Air cargo insulation studies with flowers. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 225,5 p.,illus.,tables. May 1950. 1.9 P772Ht
The feasibility of protecting boxes of commercially packed cut flowers in cold and in warm weather by covering them with an auxiliary blanket of light weight insulating material was studied. The insulating effect of several different box liners was observed.

734. BARGER, W. R. Altitude tests with flowers; effect of simulated air cargo flights. U. S. Agr. Mktg. Serv. AMS-59,29 p.,illus. July 1955. A280.39 M34Am
Originally issued as U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 224. May 1950. 1.9 P772Ht
Twenty-two varieties of cut flowers were tested at altitudes of 10,000 up to 30,000 feet. They were packed in tissue wrappers, newspapers, moisture-proof bags, or fiberboard boxes, with ice for refrigeration. Damage was greatest under dry and warm conditions, but not because of altitude alone.

735. DANIELSON, W. F., and STOHR, E. Shipping flowers by air. 4. Refrigerants. Florists' Rev. 106(2746):17-18. July 13,1950. 80 W41
Types and usage of refrigerants, precooling, circulation, flaked ice, super ice, and dry ice, are discussed.

736. DAVIS, D. R. The traffic pattern of ginned cotton, cottonseed and cottonseed products transported in Texas by railway, highway, and waterway for 1952-1953. College Station, Tex. Transportation Inst., 1956. 33 p. (Its Bulletin 4). 289 T31
Based on sample data for transportation in the processing and marketing of cotton.

737. A DECADE in coffee and tea transportation; [a symposium]. Coffee & Tea Indus. 82(11):1-88. Nov.1959. 389.8 Sp4
Partial contents: How coffee and tea are transported to the United States, by J. E. Ely, p. 10-11,56; Brazil's coffee in the world's maritime commerce, by F. P. dos Santos, p. 14; Changing patterns in coffee movements from Brazil, by C. T. Mattmann, p. 16,59; How methods of transporting coffee have changed during the decade, by J. H. Egidy, p. 18,51; Transporting coffee from East Africa, by W. C. Shields, p. 22-23,51; The evolution of coffee movements from the Ivory Coast, by P. L. Massin, p. 25-26; A challenge to transportation - the boom in Angola and Belgian Congo coffees, by E. Heyrman, p. 28,67; Moving tea from Northeast India is big business, by R. G. Hales, p. 30,53,67; Chittagong's decade of growth, by T. F. Stainthorpe, p. 32,58; Shimizu - Japan's main tea port, by M. Akino, p. 34,36,55; Getting coffee to the cup [movement by rail], by D. Lyons, p. 38,58,69; Chicago - America's next coffee port [via St. Lawrence Seaway], by R. H. Cohn, p. 42,77; Port of New York - coffee capital of North America, by S. S. Colt, p. 46-47,73; Coffee handling at the Port of New Orleans, by T. J. Smith, p. 48,68; The Golden Gate's most valuable import, by C. M. Smith, p. 50,72; More coffee imports via Los Angeles, by K. R. Sadler, p. 52; Better coffee handling methods in Portland, by T. P. Guerin, p. 54,71,72; Ship sailings; a summary of inward-bound schedules on the coffee and tea berths, p. 61-67.

738. FETROW, W. W., MCVEY, D. H., and SCEARCE, J. L. Processing and marketing cottonseed cooperatively. U. S. Farmer Coop. Serv. Gen. Rpt. 21,76 p.,illus. Apr.1956. A280.29 F22G
Transportation, p. 12-14.

739. HUDEK, H. J. Moist-pack flower shipping. Colo. Agr. Expt. Sta. B. 497-S,14 p.,illus. Nov.1957. 100 C71S
A new container was developed with full telescope lid which provided double insulation and greater stacking strength, and with corrugated board inserts to wedge the flowers in place. Polyethylene film was used in wrapping to insulate and retain humidity. Heavy newspaper liners and kraft wrapping paper was eliminated to reduce shipping costs. Limitations of the container are listed.

740. JARVESOO, E., and FITZPATRICK, R. A. Marketing the New England rose crop; a study in marketing of agricultural products. U. S. Agr. Mktg. Serv. AMS-257,9 p. July 1958. A280.39 M34Am
A report on marketing from grower to first handler. Growers used their own trucks to transport two-thirds of the roses to market. Railway express and air express were used to ship to distant markets.

The wooden box was the most common container used to local markets and the cardboard box to distant markets.

741. LAFFERTY, D. G., and COOPER, M. R. Preprocessing practices and costs of the United States textile mills as affected by the cotton bale package. U. S. D. A. Mktg. Res. Rpt. 253,18 p. July 1958. 1 Ag84Mr
Shortcomings of the package are: Type of bagging and ties used; failure to protect the contents; extra time required in handling loose and ragged bales; and extra time required in handling and storing bales of extra size and irregular shape. Labor costs for cleaning the improperly packaged cotton, loss in value of cotton, and equipment costs are given.

742. MARTIN, R. G., and GILLILAND, C. B. Weight and polarization changes of Puerto Rican raw sugar in storage and shipment. U. S. D. A. Agr. Mktg. Res. Rpt. 220,26 p. Mar.1958. 1 Ag84Mr
Greater weight losses were found in bagged sugar than in bulk sugar, but rapid shift to bulk shipments, has reduced losses from bag breakage and methods of weighing. Polarization gains of bulk sugar in shipment offset most of the weight losses.

743. MILLER, E. V. Handling and shipping southern-grown tomato plants. U. S. D. A. C. 805,26 p.,illus. 1949. 1 Ag84C
Transportation problems discussed cover ventilation vs. refrigeration, effect of cooling on growth, tests in refrigerator cars, and airplane shipments. Shipping recommendations are included.

744. MOORE, E. J. Floral marketing by wholesale growers in New York and Chicago. U. S. D. A. Mktg. Res. Rpt. 323,44 p. May 1959. 1 Ag84Mr
Summarizes transportation by truck, rail, air, bus, and parcel post, for cut flowers and potted plants, p. 10-11.

745. MOORE, E. J. Wholesaling floral commodities in the Chicago and New York City markets. U. S. D. A. Mktg. Res. Rpt. 175,illus. June 1957. 1 Ag84Mr
Modes of transportation used by suppliers, p. 12-13. Transportation used by growers, p. 25.

746. PATREY, H. B., and KOLODNY, J. Successful methods of wholesale tobacco distribution. New York, Natl. Assoc. Tobacco Distrib., 1957. 672 p. 69 P27
Delivery systems, p. 593-610, contains analysis of methods, costs, frequency of delivery, drivers and care of trucks, leasing of motor vehicles, and delivery charges.

747. PETERS, C. W. Direct mail shipments of Hawaiian cut flowers and foliage. II. Hawaii. Agr. Expt. Sta. Agr. Econ. B. 15, 30 p. Sept.1958. 280.9 H312
Contains some discussion of loading and shipping, time required for delivery, arrival condition, and efficiency of packaging.

748. PETERS, C. W. Selling Hawaiian floral products; a market appraisal. I. Hawaii. Agr. Expt. Sta. Agr. Econ. B. 10,44 p.,illus., tables,charts. Dec.1956. 280.9 H312
Volume and trend of shipments of flowers and foliage are shown in tables 1-5, by airfreight and by ocean freight, and in charts 1-2.

The gross shipping weight is shown by months 1949-1955, for different floral products.

749. POATS, F. J. Marketing of liquid sugar. U. S. D. A. Mktg. Res. Rpt. 52,76 p.,tables. June 1953. 1 Ag84Mr
The freight rate for liquid sugar and its effect on distribution and use, p. 28-31, includes some statements on possible solutions to the freight rate problem. The author states that in a typical truck-loading operation, a ton of sugar in liquid form is handled in approximately one-fifth the man-hour time required for unloading a ton of bagged sugar.

750. RADA, E. L. Mainland markets for Hawaiian flowers and foliage. Hawaii. Agr. Expt. Sta. Agr. Econ. Rpt. 9,163 p.,illus,maps. Feb.1952. 275.29 H312Ae
Transportation services and charges, p. 130-141. Considers airmail, air parcel post, airfreight, and ocean vessel transportation, as well as the level of rates, influence of rates on shippers' profits, and on Hawaii's competitive position. A table shows comparative shipping charges from Honolulu to Los Angeles and to New York.

751. REDIT, W. H., and WRIGHT, R. C. Tests on the packaging of gladiolus for protection against freezing. U. S. Bur. Plant Indus. Soils & Agr. Engin. H. T. & S. Off. Rpt. 200,4 p.,illus,charts. Jan. 1949. 1.9 P772Ht
A comparison of the amount of wrapping required in different types of shipping containers to prevent freezing damage to gladiolus shipped from Florida to northern markets. The containers were the banana type hamper, and the ventilated and the unvented cardboard cartons.

752. SHERER, S. J., and STOHR, E. Shipping flowers by air. I. Airline studies. Florists' Rev. 106(2734):37. Apr.20,1950. 80 W41
Explains the scope and program of the research study begun in 1941 on the handling of flower shipments by air by United Air Lines.

753. SHERER, S. J., and STOHR, E. Shipping flowers by air. 2. Air shipping containers. Florists' Rev. 106(2737):37-38. May 11, 1950. 80 W41
Size, rigidity, manner of stacking and securing the cartons, use of broad wooden cleats to form nests for crushed ice, securing flowers with string in containers, and protection from freezing temperatures are topics discussed.

754. SHERER, S. J., and STOHR, E. Shipping flowers by air. 3. Shipping containers. Florists' Rev. 106(2741):31-32. June 8, 1950. 80 W41
Treated boxes for protection against soaking, use of cellulose packing and newspapers for insulation, waxed paper, and false bottoms in boxes are considered.

755. SHERER, S. J., and STOHR, E. Shipping flowers by air. 5. Adapting the package to specific situations. Florists' Rev. 107(2762): 30-31. Nov.2,1950. 80 W41
Packaging orchids, gardenias, camellias, preventing bruising, and hamper-type containers are discussed.

756. SHERER, S. J., and MILLER, L. J. Shipping flowers by air. 6. Protective wrappings. Florists' Rev. 107(2778):23-26. Feb.22, 1951. 80 W41
Newspapers were used as inner lining of cartons and as outside liners under the kraft paper wrap. They were practical, relatively cheap, and light in weight.

757. SHERER, S. J., and AXTELL, F. W. Shipping flowers by air. 7. Ground service. Florists' Rev. 108(2786):35-37. Apr.19,1951. 80 W41
Gives sizes of cargo pits of certain passenger planes. Pallet loading with forklifts onto Cargoliners, and method of staggering boxes to increase stacking strength in the load are pictured.

758. THOMPSON, J. W. Rendering inedible animal fats; analysis of practices in Pennsylvania and Minnesota. U. S. D. A. Mktg. Res. Rpt. 282,62 p. Nov.1958. 1 Ag84Mr
Collection, p. 14-23, covers method of hauling, equipment, practices and costs, independent collectors and contract haulers, radius covered and trip routing. Tables show fixed and variable expenses for trucks, gas and oil expense per vehicle mile, number of collections and trucks used. Hourly wage paid to truck drivers is shown on p. 42. Transportation and handling costs of tallow and greases is given in tables and discussed on p. 51-53.

759. TROTTER, W. K. Problems in marketing florists crops. Cornell U. Col. Agr. Dept. Agr. Econ. & Farm Mangt. A. E. 983, 207 p. June 1955. 281.9 C81
Transportation, p. 118-129, deals with the kinds of transportation (trucks, bus companies, parcel post, rail express, and air), size and distance of shipments, express rates, comparison of rates, express services, claims, and consolidation of shipments.

760. WHITTEN, M. E., and STEVENSON, J. H. The marketing of cottonseed. Washington, U. S. Prod. & Mktg. Admin. Cotton Br., 1949. 63 p.,illus. 1.956 C82M345
Sections in this publication deal with practices in shipping cottonseed from gins to oil mills, methods of loading, average sizes of shipments by methods of transportation and by regions, average distance of shipment by gin truck, by mill truck, by commercial truck, and by rail. Shows estimated cost of loading cottonseed at gins, by specified methods and by regions, and methods of unloading.

761. YULE, A. T. Carriage of edible oils in epoxy resin coated tanks in ships. Internatl. Assoc. Seed Crushers. Cong. 36:21-23. 1958. 307.9 In8
Advantages and disadvantages of coated tanks, and how coatings are applied.

	Item
Aaron T D	522
Abdou A A	549
Achenbach P R	225
Adair J A	70
Adams D F	382
Agnew D B	1 272
Agricultural exemption	26
41 65 88	89
98 99 104	109
111 113 115—	117
119 123 124	608
618	
Agricultural Marketing Act 1946	125
Ahrens C L	535
Air Transport Association of America	127
Air transportation 23	43
71— 73 75	76
78 81 84	127
150 213 340	591
650 733— 735	744
748 750 752—	757
Akeley R V	682
Akino M	737
Albert G D	210
Allegri T H	254
Allen F W 474	475
Alvis V Q	128
American Institute of Cooperation	22
Manufacturing Div	23
American Railway Development Association	44
American Society of Refrigerating Engineers	211
American Trucking Association	11
Amos J M	479
Anderson C M	521
Anderson D	268
Anderson F B	732
Anderson G E	211
Andrews B G	337
Apples 44 212 350	377
378 383— 398	
Apricots	345
Argue J H	315
Arnold J S	589
Aronow W A 712	729
Asparagus	44
Association of American Railroads 3 44	338
Car Serv Div	129
Refrigeration Car Research	212 442
Atrops E P 355	405 407
408— 413	415— 419
Auchenback P R	241
Aughnay F P	480
Automobile Manufacturers Association	130
Avocados	343
Axelrod A	95
Axtell F W	757
Babb E M	273 274
Bakken H H 277	481 482
Bananas 253 337	361 370
371 372	
Barber H R	405 407
Bardwell E T	613
Barger W R 71	213 232
339 340	364 627
628 629	661— 665
696 704	713— 718
720 731	733 734
Barley 137 490	491 523
536 544	
Barr E L	341
Barr W A	301
Barry E J	483
Barry G	366 630
Bartlett R W	332
Baskets 453 455	459 460
464	
Baum E L	275
Bauman J N	24
Baumer E	315
Beal G M	276 277
Beans	654 660
Beef 550	555 563
Bemis K P	194
Benfield P L	356 462
Benjamin E W	590
Bennett R M	137
Benson H J	484
Berg K	485
Bibliographies	1— 21
Bigham T C	399
Bird K	666 667
Birdiback	6
Bishop R W	591

Item

Black G 25 88
Black W R 630
Blount J P 72
Bluestone H 486
Border G A 448 696
Bowling C B 157
Bowman E K 684
Bowring J R 278 279
Boxcars 28 50 246 247
258 513 515 539
543
Bradford H W 592
Breakiron P L 226 255 443
444 445 453 550
596 631 657 720
Bredo W 26
Brensike V J 487
Bressler R G 310
Bretz R 195
Briscoe N A 562
Broccoli 659
Brooke D L 632 719
Brooker M A 400 421
Brookings Institution 47
Brown A A 488
Browning J W 206
Bryan J E 712
Buchanan P L 299
Buford W R 722 724
Bulk boxes 209 264 346
352 362 385 389
524 693
Bull R L 2
Burr K O 217
Burress T 280
Burt S B 257
Burt S W 262 337
Butter 162 325
Butz W T 273
Byrne C H 235
Byrne R J 27 113 131
518 552 618

California Fruit Exchange 342
California Grape and Tree Fruit League 366
California Terminal Railroads 30
Cammeyer G D 454
Camp T H 455
Campbell T C 89
Cantaloups 442 448 450
451 452
Capel G L 401
Carey L C 196
Carlsen E W 383 384 387
Carmichael W W 363

Item

Carrots 44 627 628 631
635
Cassell G R 73
Cattle 578 580 583 584
586
Cauliflower 633 637— 641
646
Celery 44 204 648 659
Ceponis M J 463 629
Chapman W R 281
Chapogas P G 344 630 677
Chartrand J S 537
Chelquist G 282 315
Cherries 344 345 347 349
357— 360 382
Chickens 597 598 601 615
616
Chicks 591 599 612 624
625
Church D E 28 29 63
74 132— 134 158
159— 162 402 489
668 669
Citrus 10 44 399— 441
Clarke D A 283— 285
Clarke O 23
Claypool L L 213
Clemens J R 286
Clements J R 474
Cochran J D 243
Coffee 737
Cohn R H 737
Colbert J W 214
Cole T W 551
Collier J T 256
Colt S S 737
Competition 23 38 43
46 59 126
Conlogue R M 726
Connecticut Milk Producers Association 307
Conner M C 287
Containers 6 10 19— 21
23 44 67 194
195— 209 226 635
air transport 75 81 84
apples 383— 387 390 393
394 395 397
apricots 345
avocados 343
carrots 204 635
cauliflower 633
celery 648 659
cherries 344 345 349
358
chickens 601
chicks 625

Item

Containers--Cont.
citrus 408 430 436— 438 441
cranberries 344 354 356
dried milk 314
eggs 602 623
engineering and design 199 202 252 362
feed 528
film liners 349 350 378
flour 509 524
flowers 739 740 751 754 755
fruit 346 350 352 362 380
grapes 353 374
lemons 416
lettuce 204 630 631 636 647 657
mangoes 363
melons 204 208 448
oranges 405 407 409 411 416 423 427
peaches 379 453 455 457 459 460 464
pears 465 469 477 478
plums 366 367
potatoes 661 666 667 671 677 685 693 695— 697 704 706 707
prunes 379
standards 196 200 623
strawberries 340 348 351 369
tangerines 433
tomatoes 712 719— 721 728 729
turkeys 617
vegetables 195 196 203 204 206— 208 651 659
SEE ALSO Baskets; Bulk boxes; Crates; Fiberboard boxes; Lugs; Pallets; and Wooden boxes
Conversion factors 147
Conyers L N 131 552
Cook F L 466
Cook H L 288
Cook H T 9 10 372
Cooper M R 741
Cooperatives 22 27 111 131 282 291— 293 315 552 576 592 610 611 738
Corbett J W 31
Corley J R 137
Corn 137 481 486 490 491 494 495 523 533 534 536 544
Cornell Agricultural Experiment Station 692
Costs 16 23 24 26 34 43 56 57 62 69 84 162 173 262 263 273 274 285 391 401 429 431 457 465 485 493 503 510 514 516 534 558 592 593 606 607 666 668
SEE ALSO Freight rates
Cotton W P 289
Cotton 158 160 174 175 736 741
Cottonseed 732 736 738 760
Cowan R 298 299
Cowden J M 290— 293
Cranberries 344 354— 356
Crates 351 356 423 436 438 441 457 601 631 647 648 712
Cray R E 593
Cream 304
Crofts S E 294
Crow W C 90 456
Cubbedge R 422 428 433 436— 438 658
Cubbedge R H 403 432 434 441
Cullen E O 3
Cunningham H M 40
Curry T C 91 644

Dahill E J 197
Dahl R P 490 491
Dairy products 15 26 96 226 272— 336
SEE ALSO Butter; Cream; Ice cream; and Milk
Danielson W F 735
Dates 376
Davis C L 670
Davis D R 736
Davis G B 465 671 707
Davis G N 450
Davis L H 135
Decker C S 300
Dewey D 163
Dewey D H 663

Item

Dewey R L 63
DeWolfe M R 58 132 164
165
Dieterich R H 215
Directories 32 51 52
85
Donahoo A W 57
Dreesen W H 553
Dubey A 479 492
Duerden R S 383 384
Duff B E 211
Dunlap C S 23
Dykstra K G 235

Earle C B 443
Earle W 594
Economics 33 41 43
65 66
Edgar A D 672 691
Edwards J B 75
Eggs 4 139 589 590
592— 594 596 600
602 606 607 609
610— 612 614 619
623 624
Egidy J H 737
Ehrich R L 490
Elfving T M 216
Elliott W H 63
Ely J E 737
Emerson H C 217
Engelbrecht W H 651
Enger M R 514 720
Equipment 254— 271
Evans W L 120
Exempt Commodities Act of 1958 123

Faber F L 4
Fagg C J 32
Fair M L 33
Farmers Union Federated Co-operative Shipping Association 552
Farrell K R 136 493
Farris P L 494 495
Fats and oils 758 761
Federal-Aid Highway Act of 1956 114
Feed 484 488 494 507
526— 528 530 538
540 541 621
Fetrow W W 738
Fiberboard boxes 195 198
202 356 366 374
380 393 405 407
408 409 416 423
427 441 457 477

Item

Fiberboard boxes--Cont. 630
657 661 666 671
677 693 707 720
Fielding A M 198 450
Findlen H 231 673 674
675 678 689 691
699
Finner W F 34
Finnie D N 496
Fischer C M 595
Fischer J 497
Fisher A C 295 296
Fishyback 6 61 79
531
Fitzpatrick R A 740
Flaxseed 521 536 544
Floriculture 8
Flour 26 487 496 497
499 506 509 510
513 516 524 539
542 543
Flowers 78 81 213 733
734 735 739 740
744 745 747 748
750— 757 759
Folsom D 676
Food 16 62
Foote R J 38
Forgash M 23
Fortner L U 465
Foster R O 137 498
Fountain J B 343— 345
Fowler S H 554
Fraser D V 35
Freeman R M 478a
Freight rates 26 33 35
49 51 58 62
67 70 76 79
100 101 105 113
120 126 142 152
157— 193 210 217
219— 221 223 226
238 239 253 271
297 305 307 341
399 401 403 414
422 426 428 431
440 453 478a 480
487 488 493 501
502 503 508 517
520 521 527 529
532 537 539 548
553 558 564 567
569 573 580 582
600 603 604 611
612 619 626 643
669 705 735 749
750 751

Item

Freight rates--Cont.
decisions 59 116 183
184— 191
Freight Traffic Redbook 32
French C E 315
Friedman B A 413 417 449
460 663 714 716
722 724
Frozen foods 44 51 52
113 139 210 217
219 220 223 226
227 235 271 403
414 422 426 428
440 603 604
Fruit 12 25 29— 31
36 44 45 54
71 78 81 110
113 134 139 140
142— 144 146 147
158 159 168 170
173— 175 181 195
196 203 206— 208
213 218 220 221
226 238 239 253
264 337— 382
SEE ALSO Apples; Apricots; Bananas; Cherries; Citrus; Cranberries; Dates; Frozen foods; Grapefruit; Grapes; Lemons; Mangoes; Oranges; Peaches; Pears; Plums; Prunes; Strawberries; and Tangerines
Fuller L T 48

Galaspie L E 23
Gallagher V 363
Garver C E 403 422 565
604
Gaston H P 264 346— 348
357— 359 385 389
Gentile J C 300
Gentry D L 76
Georgia State College Business Admin 261
Gerhardt F 349 350 378
Gerrity M V 228 403 445
555 564 565
603
Giannini Foundation of Agricultural Economics 25 283
377
Gilbert F A 351
Gilbraith K 400 421
Giles E J 287
Gilliland C B 742
Ginn J L 457 633
Giovannetti B E 450

Item

Glading G R 2
Gleason J M 499
Goddard W F 241
Gohmert R L 731
Goldberg R A 500
Goldenberg S 6
Goltz G 556
Gorman E A 218
Gorton J 578
Grain 33 95 129 136
137 479— 548
SEE ALSO Barley; Corn; Oats; Rye; Sorghum; and Wheat
Grant W J 315
Grapefruit 420 429 432
Grapes 44 238 339 341
353 364 368 373
374
Greene R E L 688
Greig W S 634
Grierson W F 425
Grim J H 243
Grimes J W 225
Grover L H 580
Guerin T P 737
Guilfoy R F 219 220 236
557 560 563
Guillou R 199 221 352
Gwin J M 590

Hailey J R 446
Haldeman R C 42 137
223 498 501— 504
Hale P W 353 633 635 677
Hales R G 737
Hall C W 319 540
Hall H M 200
Hall J D 222 428 596
Haller M H 5 458— 460
Halsey L H 721 730
Halvorson H W 288
Hamer A A 355 369
Hamman C L 26
Hamrick D O 404
Hand P E 297
Hannum D B 368
Hansen C M 360
Hansen J C 675 678 679
Hanson A D 31
Hardenburg 370 386 423
689 722
Harding P L 427
Harding P R 356
Harper W R 6
Harrison R W 474
Hartley J R 483 505
Hartsock J W 282 315
Harvey E M 354 405— 419

Item

Harvey J M 466 629 655
662 665 718
Hassler J B 558 559
Hatton T T 420
Hawes F W 506
Hay 519
Heard H C 507
Hedlund E C 508
Heebink T B 201
Heintz R J 680
Heinze P H 371 674 681
Henderson A S 298 299
Henderson J M 36
Henry W F 305 307
Henry W R 38 597 598
Henschen E K 512
Herder R J 490
Herdman W A 37
Herman R S 509
Herrick J F 254 257 262
265 383 387
388
Heyrman E 737
Highways 42 61 149 331
Hillman J S 92— 94
Hinds R H 223 560 599
Hiott T 363
History 40 53 68 105
117
Hoecker R W 73 453
Hoffman S S 258
Holland R 363
Honeydew melons 448— 450
Hoofnagle W S 421
Horses 588
Horticulture 8
Horton T 243
Hoskins W G 510
Hruschka H W 354 368 407
409 416 432 433
436— 438 637— 641
682 683
Hubbard O D 636
Hubbert F 561
Hudek H J 739
Hudson W J 63 511 512
Hunter D L 383 384
Hunter J H 137
Hyslop J D 491

Ice cream 294 300 321
Illinois Studies in the Social Sciences 508
Indiana University Bur Business Research 505
Ingersoll A C 23
International Association of Ice Cream Manufacturers 300

Item

Ishee S 301— 302

Jacks B H 600
Jamison L R 513
Jarvesoo E 740
Jay J E 259 514
Jenkins S L 562
Jennings H 303
Jensen C 304
Jensen W S 447
Jessen V T 644
Jewett L J 601
Johndrew O F 602
Johnson E F 696
Johnson H B 224 260 722
723— 725
Johnson H D 63 220 222
223 225— 228 241
422 428 555 563
564 565 603 604
Johnson H L 261
Johnson H N 478a
Johnson J M 687
Johnson S 305— 307
Johnston E F 684
Jones A D 566
Jones G W 467
Jones H B 613

Kansas City Grain Exchange 95
Kasmire R F 629 696
Kaspar J C 696
Kaufman J 231 354— 356
364 410 418 419
423 428 439 441
443 444 459 476
637— 641 658 664
676 699
Keefe D R 491
Keller W L 77
Kelley J N 229 230
Kelley P L 308 309
Kellicutt K Q 202
Kelsey A J 265
Kennedy E J 685
Kercho M R 257 262
Kessner T L 95
King G A 310
King R A 38 605 626
Kirby J F 515
Klein J E 311
Koch A R 34
Kolbo H H 243
Kollman W 516
Kolodny J 746
Korzan G E 660
Koudele J W 606
Krames L C 696

Item

Kriesberg M 263
Kushman L J 642 686– 688
Kutish L J 96

Lafferty D G 741
Lamb R H 450
Lambert W A 468
Landt E F 202
Langford W D 643
Leavens D C 63 166
Legislation 88– 126
Lemons 413 415– 418
Lentz C P 214
Lessing C J 478a 517
Lettuce 44 238 629– 631
636 644 647 649
653 655 657
Levin J H 264 347 348
357– 360 385
389
Lieberman M 645
Limmer E 97 98 138
167– 171 518
567
Lindsay H C 243
Linnenberg C C 36 39
58 99 118 139
178 179
Lipton W J 450
Little J E 40
Livestock 26 33 74
122 129 174 175
248 249 549– 588
SEE ALSO Cattle; Horses; Sheep; and Swine
Livestock Conservation 568
Loads and loading 6 10
34 44 197 198
200 205 226 254
255 257 260 262
268 270 321 337
352 365 379 383
384 387 393 394
401 405 407 408
411 419 443 444
448 451 452 455
468 477 485 514
672 683 684 693
Locklin D P 41
Lowstuter A B 265
Lugs 348 349 358
Luhman G B 312
Lutz J M 7 231 405 673
674 689– 691 698
699 701 709
Lynch T R 203
Lyons D 737

Item

McBirney S W 387 390
McColloch L P 721 727 730
McCombs C L 395
McCoy J H 537
McGaha M E 692
McGlothlin R S 519
McKillop A A 232 661 715
McKinney K 313
Macomber A Z 8
McPherson W K 569
MacRill J R 410 412 418
419
McVey D H 738
Maine University College of Agriculture Extension Serv 693
Malkin R 78
Malphrus L D 520 726
Mangoes 363
Manion W M 521
Mann G 361
Marcoux W T 42
Marketing 34 57 63
125
Marousek G E 562
Martin J H 614
Martin L R 522
Martin R G 742
Marzke F O 314
Massin P L 737
Masters B M 451 646 657
659
Masters S 537
Matthews H O 300
Mattmann C T 737
Meat 26 245 553
554 556 564 567
569 573 581 582
585
Meckstroth G A 432 436
437 438
Melons 44 442– 452
SEE ALSO Cantaloups; Honeydew melons; and Watermelons
Merchant C H 694
Meyer J R 43
Miler A H 317
Milk
bulk tanks 1 272 275
276– 279 280 284
290– 292 295 296
298 299 301– 303
308 309 312 313
315– 317 319 320
322 324 326– 328
332– 336
collection 275 282 284
289 292 293 297

Item

Milk--Cont.
collection--Cont. 305 307 336
delivery 273 274 283 285 287 288 306 310 311 323
dried 314
marketing 277
regulations 331
vending machines 311
Milk Industry Foundation 316
Miller A 315
Miller C J 95
Miller E V 743
Miller L J 756
Minneapolis Grain Exchange 95
Mitchell F G 469
Mittlebronn R F 79
Mixon J A 63
Molasses 525 547
Moore C B 204
Moore E J 8 744 745
Morris L L 213 232 449 629 644 665 714 716 717 731
Morrison W R 522
Mortenson W P 607
Morton N 608
Motor Carrier Act of 1935 89 104 109 116 126
Motor Carrier Act of 1940 109
Motortrucks SEE Trucks
Muenz L 523
Muller F 23
Mulvihill C A 234
Munson H C 31
Munter A M 235
Murray D L 319
Myers E C 647
Myers K 720
Myrick N 318

Nash B D 23
National Fitch Corporation 496
National Highway Program 56
Neal J D 45 643
Neill R C 424
Nelson D C 544— 546
Nelson J C 46 47
Nelson R A 100 172
New England Research Council on Marketing and Food Supply 4
Newberg R R 570
Newhall W F 425
Newsom D W 725
Newton M P 696
Nicholson H W 101

Item

North Central Grain Marketing Research Committee 136
Northern Cooperatives 27
Norton H S 102 103

Oats 481 490 491 494 495 533 534 536 544
O'Brien M 362
Olivieri J A 481 482
Onions 44
Oranges 162 338 401 402 405 407 409— 412 415 416 419 420 423 427 432
Oregon Potato Commission 707
Oregon State Dept of Agriculture 707
Oswald J W 696
Oyloe T 609

Packaging 2 19 20
Padgett J H 320
Pallets 6 44 194 201 205 268 383— 385 387— 390 685
Patchen G 387
Patrey H B 746
Patterson G 321
Pauls D E 275
Paulson W E 651 652
Peaches 5 44 377 379 453— 464
Pears 44 212 350 378 465— 478
Peck M J 43
Pederson G N 315
Pence F M 602
Penney R W 236 241 563
Penrose G L 48
Pentzer W T 213 237— 239 364 664 727
Peppers 632
Perishable Agricultural Commodities Act 91 120 121
Perry A L 694 695
Perry R L 322
Peters C W 173 655 747 748
Peterson W E 240
Pfening F D 524
Pflug I J 365
Phillips C W 225 241 242
Phillips S W 80
Phillips V B 571
Pierce C W 297
Piggyback 3 6 42

Item

Piggyback--Cont. 44 61
143 146 256 260
261 266 269 553
Pilibos S 450
Pilz E J 366 367
Pingrey H B 572
Pinkney J F 104
Plowman E G 49
Plummer K V 243 244
Plums 366 367
Poats F J 525 749
Policies 23 39 46 47
49 58 63 100
178 192
Pollak H 245
Porter P H 266
Porter W L 246 247
Potatoes 9 26 44 162
661– 711
Poth L A 105
Poultry 4 122 226 589
590– 626
SEE ALSO Chickens; Chicks; and Turkeys
Powell J V 391
Pratt H K 449 450
Preli L A 697
Presidential Advisory Committee on Transportation Policy and Organization 59
Prizer J B 106
Prosser D S 425
Prunes 338 379
Public Affairs Institute 269
Puder R W 23
Purcell M R 50 63 107
108 140 141 192
267 426
Purcell R I 205
Purdue University 44

Quick Frozen Foods 51 52

Rada E L 750
Radspinner W A 395 405
411 415 416 427
458 470– 475 627
665 687 714 716
717 723
Railway Express Agency 44
Railways 23 31 32 46
47 48 55 68
128 132 138 152
153 156 259 265
Ramsey G B 354 355 463
642 655 723
Ransom R W 248 249 573
Ratcliffe H E 592 610 611

Item

Raunikar R 598
Redit W H 10 81 211
222 228 242 250
354 368– 372 392
414 417 428 461
462 463 471– 473
683 689 698– 701
751
Reese R B 174 175
Reeves G 160
Reeves H T 142
Refrigeration and temperature control 30 44 51 52
77 120 210– 253
271 281 286 294
329 330 338– 352
355 356 361 368
369 373 375 376
381 382 387 392
398 403 405 407
408– 412 414– 420
422 428 429 432
436– 440 448 449
458 461– 463 466
467 470– 476 556
564 603 604 629
637– 641 645 649
650 653 658 661
662– 665 674– 676
678– 683 687 689
691 698 699 700
701– 704 708 709
713– 715 717 718
722– 725 727 731
Refrigerator cars 10 50
229 338 683
development 234 243
equipment 211 232 248
439 441 573
718
fans 224 231 368 369
382 409 415 470
715
heaters 212 370– 372 392
398 470 472 473
674 689 691 698
699
icing 214 228 375 410
412 413 417 418
432 437 442 466
565
improvement 230 244 252
253
moisture 216
performance 223 236 237
249 356
statistics 233
Regulation 43 49 53

Item

Regulation--Cont. 88– 126
266 331 551 622
Reubelt V A 395 459 650
691
Rhodes R G 166
Rice 514 518 531
Richardson H B 373 374
Rickenbacker J E 574– 577
Rickey L F 526– 528
Riley H M 578
Rinear E H 612
Ringel S M 355 466 718
Rion K E 648
Roach H Q 676
Roberts M J 53 399 529
Roberts N K 579– 580
Robertson B C 728 729
Robinson R W 288 323
Rogers G B 530 613
Roof J B 324
Rooke E A 214
Rosanoff B P 646
Rose D H 9 10
Rothbauer T C 614
Rowell J D 92– 94
Russell S 82 83
Ryall A L 368 375 381
448 449 474 475
476 649 663 702
703 704 709 715
733
Rye 536 544
Rygg G L 376

Sadler K R 737
Sainsbury G F 378 477
St Lawrence Seaway 42 68
80 83 87 479
483 492 498 501
504 505 737
Sammet L L 377
Samuels J K 425
Santos F P dos 737
Sargent R 38
Saunders H 363
Saunders R F 601
Savage J 531
Sayward P 251
Scanlan J J 592
Scanlon J A 405 409 410
Scearce J L 738
Schneider E 325 581
Schomer H A 349 378 477
645 650
Schoolcraft C D 54
Schumaier C P 532– 536
Scott R R 655
Scott W 537

Item

Seagraves J A 538
Seals D 109– 111 176
Seltzer R E 429
Semolina 499 542
Shadburne R A 379 393
Shaffer P 268
Sharkey J B 48
Sharp J W 479
Sheep 572 578 579 583
Sherer S J 752– 757
Shields W C 737
Shott J G 269
Showalter R K 650 721 730
Shreve R O 26
Simmons W M 615 616
Sims J C 600
Sinclair R O 326
Slavich J 55
Smith C M 737
Smith C N 632 719
Smith E 394 395 398
Smith E B 539
Smith H 731
Smith H V 142
Smith M A 458– 462 642
Smith R J 430
Smith R T 177
Smith T B 206 207 617
Smith T J 737
Smith W L 463 682
Snitzler J R 56 112– 114
134 270 396 618
705
Snowden O L 57
Sommer N F 380 478
Sorensen H B 651 652
Sorenson V L 540
Sorghum 137 536
Sorrell L C 485
South Dakota University School of Business Admin 105
Southgate R W 115
Soybeans 137 481 491 494
495 500 508 523
533 534 536 544
Sparks W C 706
Sperling C 42 58 116
117 118 178 180
Sprinkler systems 557 560
Spurlock A H 431 634 721
Stainthorpe T F 737
Stanford Research Institute 26
181
Stark D U 84
Statistics 127– 156 233 267
342 454 481 482
490 491 494 495

Item

Statistics--Cont. 523 533
534— 536 539 544
545 546 581 583
584— 586 590 618
620 652 656 705
719
Stedem J J 300
Stedman G C 119
Stegman H S 252
Steinbauer W H 120
Stelly R 313
Stemberger A P 619
Stenason J 43
Stenger A 541
Stevens F J 23
Stevens G A 464
Stevenson J H 760
Stewart J K 450 629 653
696
Stiles C E 40
Stocker N 327
Stohr E 735 752— 755
Stokes D R 343 353 366
635
Storey D A 495
Strawberries 44 340 348
351 369 375
381
Strong H G 211 242
Sugar 33 742 749
Sweet corn 44 634 645
650 658
Sweetpotatoes 642
Swine 557 559 560

Taff C A 11 59
Talmey P 542 543
Tangerines 433
Taxation 97 103 112 114
Taylor C W 253
Taylor F R 544— 546
Taylor K A 279
Tea 737
Teal E 282 315
Teal R H 707
Termohlen W D 590
Texas Citrus and Vegetable Growers and Shippers 143
Thom E 328
Thompson J A 654
Thompson J W 758
Thompson W H 182 582 620
621
Thompson W J 329 330
Thor E 425
Ticknor B H 547
Tobacco 746
Toko H V 682

Item

Tomato plants 743
Tomatoes 44 712— 731
Trade barriers 26 92 102
105 107
Transcontinental Freight Bur 44
Transportation Act of 1958 99
109 117 118 178
Transportation model 38 619
Trotter W K 759
Truck-Trailer Manufacturers Association 241
Trucks 11 37 48 53
68 316 396 400
456 539 549 599
679
cooperative use 27 131
delivery 24 240 257
262 263 270 281
286 318 484
farm routes 606
forklift 357 377
leasing 50 111 119 300
318 571 696
pickup 280 303
refrigeration 210 215 219
222 226 227 245
250 286 294 329
330 403 414 422
556 564 604
regulation 88— 90 92
93— 96 98 99
101 102 105 107
108 115— 117 123
sanitation 587
statistics 67 130 131
133 138 140 141
145 146 149 151
154— 156 267
tank trucks 347
taxation 103
trailers 225 241 251 422
555 626
vantainers 200
Tucker C R 31
Turkeys 590 595 604 617
620
Twining C R 276

United Air Lines 752
United Fresh Fruit and Vegetable Association 12 60
U S Agricultural Marketing Serv 13 14 61 120
121 144 331 583
584 585 708
Agricultural Economics Div 145
Fruit and Vegetable Div 146
147

Item

U S Agricultural Marketing Serv--Cont.
Marketing Research Div 7 15— 18 62
Poultry Div 622— 624
U S Agricultural Research Serv 19
Animal Disease Eradication Div 122
U S Army Corps of Engineers 85 148
U S Bur of Agricultural Economics 377 586
U S Bur of the Census 150
Transportation Div 151
U S Bur Public Roads 149
U S Business and Defense Services Admin 20
U S Defense Transport Admin 656
U S Dept of Agriculture 44 63
U S Forest Serv Forest Products Laboratory 21
U S Interstate Commerce Commission 59 116 117 123 124 126 167 183 184— 191
Bur of Transport Economics and Statistics 152— 156
U S National Bur of Standards 225 241
U S Production and Marketing Admin 208
Poultry Br 624
U S Quartermaster Food and Container Institute for the Armed Forces 246 247
U S Quartermaster Research and Engineering Command 241
U S Secretary of Agriculture 120
U S Tennessee Valley Authority 548
Uota M 466

Valldejuli J J 207
Van Doren A 390
Vasiliou F K 448
Vegetables 12 25 29 30 31 36 44 45 54 71 74 78 81 110 113 134 135 139 140 142— 144 146 147 158 159 168 170 173— 175 213 218 220 221 226 238

Item

Vegetables--Cont. 239 253 255 627— 660
SEE ALSO Asparagus; Avocados; Beans; Broccoli; Carrots; Cauliflower; Celery; Lettuce; Onions; Peppers; Potatoes; Sweet corn; Sweetpotatoes; and Tomatoes
Vincent G L 731
Voegeli L J 657

Waananen M V 299 332— 334
Waid W C 412
Walton A B 222
Water transportation 23 43 61 74 77 79 85 86 95 146 148 150 156 404 408 420 434 479 486 492 522 523 548 748 761
SEE ALSO St Lawrence Seaway; and Waterways
Watermelons 443— 448
Waterways 26 70
Watson R O 696
Waugh F V 192
Wayne D C 64
Webb T F 587
Weights and measures 208
Welden W C 335
Weller J L 23
Weller W W 32
Wells C M 522
Werner H O 709
West V I 34
Western Growers Association 451 631
Western Weighing and Inspection Bur 44
Westling L L 86
Westmeyer R E 65
Wheat 26 34 95 137 160 174 175 479 480— 482 485 490 491 492 494 495 523 533— 536 539 544— 546
White E F 657
White F J 209
White M 688 710
Whitten M E 760
Wiant J S 471— 473 637— 639 676 724
Wicks S V 271
Wilcox E C 336
Wilcox M 7

	Item
Wilcox R M	670
Wilkinson E	588
Williams E W	33 126
Wilson C P	578
Wilson G L	66 193
Wilson W O	625
Winfrey J W	282 315
Winston J R	403 420 422
	432— 441 443
	444 658 678
Winter J C	63 67— 69
	225 451 452
	478a 522 646
	659
Womeldorph S E	458 460
	471 472
Wood D F	87
Wood G B	614
Wooden boxes	397 411 469
	478 657 667
Woodward H C	397
Woodworth H C	530
Wool	566
Worthington J T	228
Wright R C	711 751
Wright T R	349 382 392
	394 395 398
Wright W R	458 642
Wyckoff J B	334
York J D	315
Young R E	660
Yount P F	23
Yule A T	761
Zagarella A	257
Ziebarth C F	485
Zwick C J	43 605 626

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